

CANADA

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REPORT

OF THE

MINISTER OF PUBLIC WORKS

ON THE

WORKS UNDER HIS CONTROL

FOR THE FISCAL YEAR ENDED JUNE 30

1901

SUBMITTED IN ACCORDANCE WITH THE PROVISIONS OF CHAPTER 36,  
SECTION 37, OF THE REVISED STATUTES OF CANADA

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EXCELLENT MAJESTY

1902

[No. 19—1902.]





*To His Excellency the Right Honourable Sir Gilbert John Elliot, Earl of Minto,  
G.C.M.G., &c., &c., &c., Governor General of Canada.*

MY LORD,

I have the honour to lay before your Excellency the Report of the Department of Public Works of Canada, for the fiscal year ended June 30, 1901.

I have the honour to be,

My Lord,

Your Excellency's most obedient servant,

J. ISRAËL TARTE,

*Minister of Public Works.*

OTTAWA, January 18, 1902.



1871

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*POCKET ACCOMPANYING CONTAINING MAPS OF*

FRENCH RIVER, ONT. ✓

✓ TRANSPORTATION MAP, and

MAP OF SHIP CHANNEL EAST OF MONTREAL. *missing*



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Yorkton, N.W.T., immigration building.....		8, 25					
"    lands office.....		25					
Yukon, public buildings.....		8, 26	21				
"    rivers.....		16		140			
"    telegraphs.....	10	19			5		
"    trails and roads.....		17		236			
Z							
Zurich, Ont.....		7					







PART I

REPORT

OF THE

DEPUTY MINISTER OF PUBLIC WORKS

FOR THE YEAR ENDED JUNE 30

1901







REPORT  
OF THE  
DEPUTY MINISTER OF PUBLIC WORKS  
FOR THE FISCAL YEAR 1900-1901.

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, January 15, 1902.

The Honourable J. I. TARTE,  
Minister of Public Works,  
Ottawa.

SIR,—I have the honour to submit to you the report of the Department of Public Works for the fiscal year ended on the 30th June, 1901.

REVENUE.

In opening the report, I am glad to be able to state that the revenue accrued from the public works, under the control of this department, during the past fiscal year shows a satisfactory increase over the previous year. The revenue of the year 1900-1 has amounted to \$112,675.82, the increase over the year 1899-1900 being \$33,594.35.

The revenue of the department is mainly derived from the operation of works constructed for the descent of timber on the Ottawa, St. Maurice and Trent rivers, and from the graving docks at Lévis, Kingston and Esquimalt. In each case it has increased in notable proportions. The excess over the returns of the year 1899-1900 has been as follows, namely:—

Ottawa district . . . . .	\$ 3,574 62
St. Maurice district . . . . .	4,609 77
Newcastle district . . . . .	12,068 62
Esquimalt graving dock . . . . .	5,687 93
Lévis graving dock . . . . .	7,005 83
Kingston graving dock . . . . .	550 65

A total increase, as above, \$33,594.35.



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It must be stated, however, in connection with the above returns that the abnormal increase, observed in the Newcastle district, is due to a partial settlement of a long disputed question of rates in that section. Owing to a difference of opinion with the lumbermen concerning the right of the department to impose dues for works which the operators claimed were mainly constructed for the improvement of navigation, no collections were made since the year 1894. After much discussion with the parties interested, a settlement was finally reached, which was approved by an Order in Council of the 20th June last, and following on that Order in Council the large collection above mentioned was added to the receipts of the department.

I must take this early opportunity of expressing to you my sense of the satisfactory work performed in this connection by the Collector of Revenue for the department, as it is largely due to his untiring efforts that this settlement was arrived at, and that the returns of moneys, due to the department, were so quickly and so satisfactorily turned into the government revenue.

## EXPENDITURE.

The expenditure of the department during the year under review has amounted to \$4,699,680.54, an excess over the preceding year of nearly \$1,000,000, the expenditure in question being divided as follows :—

Harbours, dredging, bridges, &c. . . . .	\$2,670,146 82
Public buildings . . . . .	1,303,411 70
Telegraphs . . . . .	532,626 58
Miscellaneous, salaries, &c. . . . .	193,495 44
	<hr/>
	\$4,699,680 54

The greater portion of this expenditure has been incurred in connection with the improvement of the means of transportation between the great western lakes and the sea. The reader will perhaps recall the reference made at length in my report of the preceding year, concerning this improvement and the plans adopted by the department to accommodate the present needs of the country, and so to capture a portion of the transportation business now being directed towards United States channels, owing to lack of facilities on the Canadian route.

It is probably unnecessary for me to refer at great length to the report, but I may be permitted to state that the improvements contemplated have been carried on with as much rapidity as the means at the disposal of the department would allow, and as quickly as the contractors in charge of the works were enabled to construct those portions which had been entrusted to them.

The harbour works at Port Colborne have been carried on under the superintendence of a special officer of this department, stationed at that point, as well as those at Maisonneuve, which are designed to increase the already congested capacity of the harbour of Montreal, both having been proceeded with, especially the latter, in a most satisfactory way. The contractors for the latter work, Messrs. Poupore & Co., have for



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their construction, put together what is considered by experienced contractors to be the most modern and up to date plant that could be devised by wide-awake and intelligent contractors. Those same gentlemen who have undertaken the works of improvement at the harbour of Sorel, have applied the same business methods to this very important work and both are now being rushed in such a manner as to justify the expectation of their completion within the next fiscal year.

As regards the harbour of Three Rivers, which is on the main line of our great transportation route, the plans for its improvement are now in course of preparation and, soon, tenders will be called for their executive. The work is urgently required, the report of the Harbour Commissioners of that thriving city showing that the wharfs at their disposal last year were absolutely insufficient to accommodate the large volume of trade which has found a way to that harbour. The need of such improvements will be fully recognized by those who have had occasion to follow the trend of the remarkable advance in the establishment of manufacturing industries on the River St. Maurice. The large mills of the Laurentide Pulp Company, located at Grand'Mère, increase their output every year and have become a natural and important feeder to the trade of the harbour of Three Rivers. To those works have been added the improvement of the natural water power at the Shawenegan Falls, whereby important pulp and aluminium mills have been built, and where further improvements will render this point, which was, up to only a few years ago, a deserted wilderness, one of the thriving towns of the province of Quebec.

At the falls have also been located the works of the Belgo-Canadian Pulp Company, established during the course of last year.

Those new establishments have necessitated vast improvements to be made in the storing and carrying capacity of the slides and booms of the River St. Maurice, and a large expenditure has had therefore to be incurred in order to accommodate the needs of those large manufacturing concerns, which contribute so extensively to the swelling of the revenue of the department. Most of the booms, &c., of the River St. Maurice, up to last year, were the same as had been constructed at the origin of the works, and they became so enfeebled that the rush of the enormous quantity of lumber passing through them threatened at any time not only to overpower them, but to scatter over the St. Maurice the logs manufactured by and destined to the several concerns established on its banks. A further amount will be required to improve the works at Grand'Mère, but the large increase of revenue from the St. Maurice river for the past few years, and the expected enlarged return of dues in the future will more than equalize the expense to be incurred.

## HARBOURS AND RIVERS—SHIP CHANNEL, MONTREAL TO THE SEA.

Last year, in introducing the report of this department, I referred to the important work carried on by the department in the ship channel between Montreal and Quebec. I also referred to the contemplated improvements and especially to the additions which were intended to be made to the fleet of dredges under the control of this department for the continuation of the improvement of the channel and the



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deepening of the same to the intended depth of 30 feet at low water. The report of the officer in charge will show the work performed last year when the dredges worked day and night in order to carry out the work with the least possible delay. I am glad to be able to state that the large hydraulic dredge, the construction of which was foretold in that report, is now fully completed and will next year begin the task of improving the channel in Lake St. Peter.

That channel, which is now 350 feet wide and about 26 feet in depth, will be widened to 500 feet and deepened to 30 feet, and it is expected that the dredge will accomplish that work within the very short period of two years. This dredge is without doubt the most complete machine of its kind to be found on this continent, and probably in the world. It is designed to have a capacity of 2,000 yards per hour, and the enormous amount of work that it will perform, compared with that of the present dredges, will be seen when we consider that the best elevator dredges now operated by the department, on the ship channel, will only remove a quantity equal to between 2,000 and 4,000 yards per day.

A description of this type of dredge was given at length in last year's report, and it is needless to refer to it again this year, further than to say that at the trial made in Toronto, the experiments showed that the machinery worked to perfection, and that the dredge, as designed, will entirely fulfill expectations.

In connection with the improvement of the channel, I have much pleasure in stating that the portion of the river between Quebec and the sea has not been overlooked. Outside of the improvements in the buoy and lighting system carried on by the Department of Marine and Fisheries, this department has ordered a survey to be made of the north channel, below the Island of Orleans, between the north shore and the group of islands to the south of the Island of Orleans, comprising L'Île Madame, L'Île aux Réaux, Grosse Isle, L'Île aux Grues, L'Île aux Oies, &c. This survey, however, has not, I must say, had the result of upholding the opinion of those who were in favour of utilizing that channel in preference to the southern one, and any improvement which may be made will require to be carried on in the latter, which, after all, is the one which has been used for years past and is the one better known to navigators of the St. Lawrence below Quebec. It is the intention of the department to cause a survey to be made of the south channel, especially of that portion lying to the south of L'Île aux Grues, with the view of determining the amount of work which will be required, and when that is established, means will be taken to carry on the necessary works of improvement. The execution of that work, together with the improvements in the Traverse, will considerably increase the safety of navigation in that channel.

The total sum expended in connection with the improvement of the ship channel between Montreal and Quebec, during the past fiscal year, amounts to \$432,557.69; this includes the hydrographic survey begun some years ago, and which has now reached a point below Three Rivers, and is expected to be completed within about two years.

In connection with this transportation question, and the efforts made by the department to give Canadian shipping a route which will be the shortest and will pro-



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vide the best possible accommodation, it is to be regretted that the arrangements which have, at various times, been proposed for the improvement of receiving and shipping facilities at Montreal, have not been crowned with success. It is hoped, however, that further negotiations will permit of the required improvements being carried out, which will at once furnish the proper facilities and remove that growing feeling of doubt as to the port being, within a reasonable time, properly equipped so as to accommodate all the trade which should naturally come to it. Up to the present time no scheme has been propounded which could properly receive the approval of this department, and however desirable and necessary those improvements may be, still the large expenditure to be incurred in order to procure them, and the degree of permanency which must be attained in their completion, render it necessary for the department to be more than careful in granting its approval to any scheme but the one which will procure the greatest usefulness joined with the best mode of construction that can be provided. Surely it is possible, with the experience of similar constructions, to evolve a plan which will be acceptable not only to the department, but to the growing needs of the ever increasing trade.

Referring in a general way to the work carried on under the superintendence of the able Acting Chief Engineer, Mr. E. D. Lafleur, I must say that outside of the superintendence of the important works above referred to, the other harbour works in the Dominion, for which a large supply of money was voted by parliament, have been carried on with the greatest degree of economy and efficiency. Taking advantage of the experience gained by the department, the Acting Chief Engineer has, in the works of construction and improvement carried on throughout Canada, by choosing the best methods and utilizing the services of his staff of most reliable assistants, procured for the department very satisfactory results.

Details in reference to the harbours, rivers, slides and booms, will be found in part 4 of this report. A perusal of the same will be found very interesting, giving, as it does, very reliable and complete data as to the work performed.

The work of dredging has, it will be found, increased enormously, and the plant at the disposal of this department is hardly equal to the work to be performed. However, the construction of a large dredge for the maritime provinces, and one for the province of Ontario, now building at our shipyard at Sorel, will fill, within a short time, the need which has been apparent for the last few years. For the construction of those dredges, the works at Sorel have been greatly enlarged and new working methods adopted, as well as a proper superintendence and subdivision of the work under your orders, which will ensure magnificent results and will show that those works will be of a capacity to enable us to not only construct what is needed for the department, but, should it be required, to do work for other branches of the government service. The machinery installed is of the latest and most improved design, and the staff is working with a will, under the direction of the department, in a manner which is deemed to be highly satisfactory.

Before I close my reference to the ship channel between Montreal and Quebec, permit me to call attention to the accidents which have occurred to shipping during the



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past fiscal year. Of the 13 accidents which have occurred, it was found after investigation, that 9 were due to bad pilotage, 2 to unmanageable steering apparatus, and 2 that were claimed by the pilots to have been caused by defective gas buoys. In no case was any one of those accidents held to have been due to the bad state of the channel under the control of this department, and this is a satisfactory proof of the great value of the work of testing and sweeping the channel which is systematically carried on by Mr. Engineer Cowie, under your orders and the supervision of this department. Whenever during the testing and sweeping period in question, any buoy is found to have been displaced or any change in the nature of the channel has taken place, the matter is at once reported to the department. If the trouble be due to a displaced buoy, the officers of the Department of Marine are immediately notified. If any change dredging be necessary, a dredge is immediately placed on the spot to remove whatever temporary obstruction may have been created.

It is my pleasant duty to say that this part of the work of the department is carried on very faithfully by the officers entrusted with the same, and too much praise cannot be given to those in charge at Sorel, Mr. Howden and Mr. Desbarats, as well as to the other members of the staff engaged on this service.

The above hurried statement in connection with the transportation route, and especially the improvement of its most important section between Montreal and the sea, would not be complete were not reference made to a most important adjunct of the same which has been before the public for some time, and which has been most prominently brought forward by yourself at various times, namely, the improvement of the French river from Georgian Bay to Lake Nipissing. In my report of last year I intimated that a good survey was to be made, and that precise data were to be obtained in connection with the improvement of that alternative route to handle the products of the great west. The survey ordered by you has been made by Mr. Fraser, an engineer of this department, and the report of that officer will be found in the appendices of the present report. A plan of the survey has also been prepared and lithographic copies of the same are published as an annex to this report.

I need not here make a longer reference of this proposed work, the outline of which was given by you to the House of Commons last year, and to which, several times during the last few months, you have had occasion to make reference. The report, which is a very interesting one, will repay a careful perusal and will satisfy the reader that, should this work be undertaken, it will become a valuable asset to the Dominion and a great and useful link in the already important chain of communication between the western country and the sea through the Canadian route.

During the calendar year 1901, a survey was made of the Middle or Canadian channel of the St. Lawrence river, between Brockville and Kingston, in order to determine what work was required to give a channel 14 feet in depth, at low water, which would be better than the American channel now used.

There are three channels used by deep draught vessels: the first passes through neutral waters south of Wolfe, Wellesly, Grindstone and Grenadier islands and the group of American islands east of Grenadier islands, thence it enters Canadian waters



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at Cross-over light and continues through the Brockville group of islands ; the second channel is to the north of Wolfe island through Canadian waters to the foot of Wolfe island thence into American waters and follows the first route, above described, to Brockville ; the third channel begins like the second and runs in Canadian waters, north of Wolfe, Grindstone, Wellesley and Hill islands, thence joins the first channel described, in neutral waters, to the south of Grenadier island to Brockville.

A special examination was made of the third channel and it has been found that an improved channel may be obtained giving more direct and straighter courses, the work of improvement required consisting of rock excavation at certain points and the supply of the usual aids to navigation by means of lights, buoys, &c.

This Middle or Canadian channel would have an advantage over the present American channel, or the first route described, in being  $3\frac{1}{2}$  miles shorter (or  $1\frac{1}{2}$  hours difference in time) for loaded boats in tow and proportionately less for single boats, and having longer, more sheltered and straighter courses. With another and greater advantage in having a less dangerous entrance from lake Ontario as the channel to the south of Wolfe island has to pass the Charity shoals near where it enters the river.

## PUBLIC BUILDINGS.

The public buildings of the department immediately under the control of the Chief Architect, Mr. D. Ewart, have been, with the assistance of his excellent staff, kept in their usual good and satisfactory condition.

The preparation of plans, specifications and estimates for the erection of new buildings, and alterations or improvements to the old ones, has entailed a vast amount of labour which has been admirably performed under the systematic methods established by Mr. Ewart.

During the past fiscal year, six new buildings were completed and occupied, while 16 others were under construction, among these being the new public buildings at Digby, Kentville and Springhill, in Nova Scotia; Drummondville, Granby, Buckingham and Hochelaga, in Quebec; Deseronto, Paris and Picton, in Ontario; Rossland, Nelson, Kamloops and Vancouver, in British Columbia. Minor buildings have also been constructed under the superintendence of the chief architect, such as the immigration buildings at Roberval and Peribonka, in Quebec, and at several points in the North-west Territories.

Extensive improvements have also been made in the House of Commons, whereby additional rooms will be provided for the members, and a large committee room provided for the use of the committees of the House.

The lighting of the Senate chamber has also been improved with great success in a manner similar to that of the House of Commons.

During the course of the last fiscal year, under your direction, the chief architect visited Europe for the purpose of inspecting the public buildings constructed in the various European capitals, in connection with the proposed construction in Ottawa of



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the Victoria National Museum, the Mint and the new Astronomical Observatory. The visit of Mr. Ewart has been very fruitful, and plans are already completed for the mint as well as for the observatory, while those for the national museum are well in hand, and can be completed within a very short time.

I cannot close this statement in reference to the work performed by the chief architect without mentioning the excellent work done by that branch in connection with the day decorations and night illuminations of the various cities and towns of Canada, which were visited by their Royal Highnesses the Duke and Duchess of York during the past summer. The work done in the principal cities: Montreal, Quebec, Ottawa, Toronto, St. John, Halifax, &c., was of an excellent character, and was the subject of great praise from the large crowds that had occasion to witness the result of the labours of the officers of the department. The general supervision had been entrusted to Lieut.-Colonel Gourdeau and myself, by your orders, entailing a large amount of labour, which was cheerfully performed; Lieut.-Colonel Gourdeau specially placing at the service of the department the large experience gained while representing his department at the Paris Exposition in 1900.

#### TELEGRAPHS.

In my report for the year 1899-1900, I referred at some length to the work done in constructing what is called the Yukon telegraph line, as well as to the completion of the line on the north shore of the coast of Labrador to connect with the island of Belle Isle.

I have pleasure in reporting the completion of those two lines of telegraph. At the end of the last calendar year, when the work had to be abandoned on the Yukon line, owing to the season being too much advanced, there remained only a short gap between Hazelton and Telegraph Creek. This gap has now been covered by the construction party, and Dawson has been, since last summer, in telegraphic communication with the world. Last year I outlined the various advantages, to the government of Canada and to the world in general, to be derived from the construction of this important telegraph line, and it is needless to make a long reference to the same, beyond the fact that its speedy and satisfactory construction reflects great credit upon Mr. Charleson, who had charge of it from its inception and who has carried it to successful termination.

The telegraph line on the Labrador coast was also completed during the month of July, and a cable was laid between Chateau bay on the north shore and the island of Belle Isle, a distance of 22 miles.

I suggested in my last report the establishment of the Marconi system of wireless telegraphy as an alternative in order to obviate the possible stoppage of communication by the crushing, or other disabling of the cable, by icebergs or other causes. A sample of the instruments used in connection with that system was, under your instructions, inspected on board the ss. *Lake Champlain*, of the Elder-Dempster line of steamers, and immediately an order was placed with the Marconi Company, in England, for two sets of those instruments, one to be placed on Belle Isle, the other on the main shore at Chateau bay. I am pleased to be able to state that the first attempt at a



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practical use of this system on this continent was made by this department, and I am proud to say with great success, owing to the ability and care of Mr. D. H. Keeley, the superintendent of the government telegraphs, who took the matter in charge and carried it to successful completion. The Marconi system of wireless telegraphy is now before the world attracting more attention than ever owing to the visit of the inventor himself to this continent.

The system under the charge of this department seems to have worked satisfactorily, and the improvements in progress will, I hope, ensure the greatest guarantee of success.

Details required in connection with the telegraph lines under the control of this department will be found in part 5 of this report.

## GENERALLY.

The work performed by the department during the past 10 years can best be judged by the difference in the expenditure. In the year 1891, the expenditure amounted to \$2,700,000; in 1901 it had reached the figure of \$4,700,000, or practically twice the amount. The votes for the current year 1901-2 show an increase over last year's amounts of nearly 50 per cent.

I have the honour to be, sir,

Your obedient servant,

A. GOBEIL,

*Deputy Minister.*







PART II.

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STATEMENTS OF EXPENDITURE

DURING

FISCAL YEAR ENDED JUNE 30, 1901







PART II.

STATEMENT A.—Showing the Amounts Expended by the Department of Public Works of Canada, during the fiscal year ended June 30, 1901.

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main tenance.	Total.
PUBLIC BUILDINGS.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Nova Scotia.				
Amherst post office.....		65 00		65 00
Annapolis post office.....		26 25		26 25
Antigonish post office.....		86 33		86 33
Arichat post office.....		24 75		24 75
Baddeck post office.....		5 13		5 13
Digby post office.....	9,032 42			9,032 42
Dartmouth post office.....		601 32		601 32
Halifax exam. warehouse....		64 53		64 53
“ Asst. Receiver-General's Office....		102 78		102 78
“ Dominion Building.....		738 13		738 13
“ drill hall.....		924 56		924 56
“ engineer's office.....		36 00		36 00
“ immigration building.....		1,394 43		1,394 43
“ new public building.....	33 89			33 89
“ post office.....		853 65		853 65
“ quarantine station (Lawlor's Island)...	2,091 18	2,517 16		4,608 34
Kentville, post office, &c.....	6,595 87			6,595 87
Liverpool, post office..	1,932 28			1,932 28
Lunenburg, post office.....		50 14		50 14
Nappan, experimental farm.....	2,162 78	38 04		2,200 82
New Glasgow, post office, &c....		807 95		807 95
North Sydney, post office, &c.....	1,060 50	13 05		1,073 55
Pictou, custom house.....		87 40		87 40
Pictou, post office..		730 45		730 45
Springhill, public building.....	7,566 72			7,566 72
Sydney, quarantine station.....		390 00		390 00
Sydney, post office, &c.....		1,546 92		1,546 92
Truro, post office.....		707 21		707 21
Windsor, drill hall.....		170 00		170 00
Windsor, post office, &c..		23 57		23 57
Yarmouth, post office.....		578 01		578 01
Heating, lighting, water, &c., for all buildings in Nova Scotia. (For details see page 21)....			23,593 92	23,593 92
Totals, Nova Scotia.....	30,475 64	12,582 76	23,593 92	66,652 32
Prince Edward Island.				
Charlottetown, Dominion building.....		756 24	375 00	1,131 24
Montague, post office, &c.....		291 92		291 92
Summerside, post office.....		507 26		507 26
Heating, lighting, water, &c., for all buildings in Prince Edward Island. (For details see page 21).....			4,918 77	4,918 77
Totals for Prince Edward Island.....		1,555 42	5,293 77	6,849 19



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## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
PUBLIC BUILDINGS—Continued.				
<i>New Brunswick.</i>				
Bathurst, post office, &c.....		347 43		347 43
Carleton (St. John), post office....		34 55		34 55
Chatham, bonded warehouse..	1,475 00			1,475 00
" post office, &c.....		17 80		17 80
Dalhousie, post office.....		50 00		50 00
Fredericton, post office.....		1,194 61		1,194 61
Moncton, post office.....		2,031 74		2,031 74
Newcastle, post office..		117 25		117 25
Portland (St. John), post office....		18 99		18 99
St. John, custom house.....		4,506 34		4,506 34
" engineer's office.....		30 00		30 00
" generally.....			25 00	25 00
" immigration building....	598 25			598 25
" post office.....		3,546 02		3,546 02
" quarantine station.....	17,924 13			17,924 13
" savings bank.....		650 24		650 24
St. Stephen, post office.....		12 05		12 05
Sussex, drill hall.....	153 90			153 90
" post office.....		66 80		66 80
Tracadie, lazaretto.....	597 60	421 29		1,018 89
Woodstock, post office, &c.....		280 89		280 89
Heating, lighting, water, &c., for all buildings in New Brunswick. (For details see page 22).			19,740 79	19,740 79
Totals, New Brunswick..	20,748 88	13,326 00	19,765 79	53,840 67
<i>Maritime Provinces.</i>				
Generally.....		39 05		39 05
<i>Quebec.</i>				
Aylmer, post office, &c.....		331 76		331 76
Berthierville, post office.....		328 00		328 00
Buckingham, post office.....	7,911 56			7,911 56
Contrecoeur, post office.....		998 31		998 31
Dundas, custom house.....		553 20		553 20
Drummondville, post office.....	3,218 06			3,218 06
Farnham, post office.....		642 43		642 43
Fredericville, post office.....		153 37		153 37
Granby, post office.....	2,581 40			2,581 40
Grosse Ile, quarantine.....	20,021 06	0 52		20,021 58
Hochelaga, post office.....	9,994 73			9,994 73
Hull, post office, &c.....	19,425 02	50 20		19,475 22
Le Laitie, post office, &c.....		68 50		68 50
Lehigh, post office, &c.....		15 81		15 81
Lorraine, post office, &c.....		510 75		510 75
Laval, cattle quarantine.....	5,392 73			5,392 73
" immigration building.....		1,052 31		1,052 31
Madameville, post office, &c.....		194 65		194 65
Montreal, custom house.....		3,218 46		3,218 46
" drill hall.....		3 70		3 70
" examining warehouse.....		706 24		706 24
" inland revenue building....		275 13		275 13
" post office.....	1,019 17	8,351 20	3,152 22	12,522 59
" post office (St. Lawrence St.).....		5 00		5 00
Parilla, immigration building.....	1,210 00	29 00		1,239 00
Quebec, cartridge factory.....	11,316 00			11,316 00
" attached buildings.....		4,757 84		4,757 84
" civil service examiners.....		8 17		8 17
" clerk of works office.....		69 69		69 69
Carried forward.....	82,089 73	22,324 24	3,152 22	107,566 19



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## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
	\$ cts	\$ cts.	\$ cts.	\$ cts.
PUBLIC BUILDINGS—Continued.				
Brought forward.....	82,089 73	22,324 24	3,152 22	107,566 19
Quebec—Continued.				
Quebec, cullers' office.....		22 68		22 68
" custom house.....		2,758 59		2,758 59
" examining warehouse.....		62 50		62 50
" immigration buildings.....		4,832 43		4,832 43
" observatory.....		201 71		201 71
" post office.....		2,527 27		2,527 27
" post office, power for elevators .....			194 25	194 25
" weights and measures office.. ..		21 75		21 75
Richmond, post office, &c.....		22 95		22 95
Rimouski, post office.....		2 68		2 68
Roberval, immigration building.....	1,210 00	29 00		1,239 00
Sherbrooke, post office, &c.....		274 22		274 22
Sorel, post office, &c.....		389 39		389 39
St. Henri, post office, &c.....		53 13		53 13
St. Hyacinthe, post office, &c.....		2,960 49		2,960 49
St. Jerome, post office, &c.....		176 91		176 91
St. Johns, post office, &c.....		10 35		10 35
St. Rochs, post office, &c.....		2 50		2 50
Three Rivers, custom house.....		307 84		307 84
" post office.....		267 70		267 70
Valleyfield, post office.....		5 50		5 50
Victoriaville, post office, &c.....	7,997 23			7,997 23
Quebec, generally.....		108 78		108 78
Heating, lighting, water, &c., for all buildings in Quebec. (For details see page 22).....			49,395 67	49,395 67
Totals, Quebec.....	91,296 96	37,362 61	52,742 14	181,401 71
Ontario.				
Almonte, public building.....		99 05		99 05
Amherstburg, public building.....		181 76		181 76
Arnprior, public building.....		517 71		517 71
Barrie, public building.....		14 02		14 02
Belleville, public building.....		531 73		531 73
Berlin, public building.....		367 93		367 93
Brampton, public building.....		35 65		35 65
Brantford, public building.....		1,102 22		1,102 22
Brockville, drill hall.....	18,967 90			18,967 90
" public building.. ..		67 59		67 59
Carleton Place, public building.....		7 15		7 15
Cayuga, public building.....		33 25		33 25
Chatham, public building.....		646 98		646 98
Cornwall, public building.....		63 09		63 09
Deseronto, public building.....	2,204 80	6 00		2,210 80
Dundas, drill hall.....	5,863 60			5,863 60
Galt, public building.....		132 52		132 52
Goderich, public building.....		575 96		575 96
Guelph, public building.....		106 95		106 95
Hamilton, public building.....		851 67		851 67
Ingersoll, public building.....	5,490 78	38 30		5,529 08
Kingston, custom house.....		269 18		269 18
" drill hall.....	31,478 93			31,478 93
" inland revenue.....		271 00		271 00
" military college.....	4,708 39			4,708 39
" post office.....		243 00		243 00
Lindsay, public building.....		404 84		404 84
London, custom house.....		1,923 73		1,923 73
" drill hall.. ..	9,040 69			9,040 69
Carried forward.....	77,755 09	8,491 28		86,246 37



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## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Construc- tion and Improvements.	Repairs and Furniture.	Staff and Main- tenance.	Total.
PUBLIC BUILDINGS <i>Continued.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.....	77,755 00	8,491 28		86,246 37
Ontario—Con.				
London, post office.....		5,179 35		5,179 35
Napanee, public building.....		3 00		3 00
Niagara Falls, public building.....		99 98		99 98
Orangeville, public building.....		117 10		117 10
Orillia, public building.....		18 20		18 20
Ottawa parliamentary and deptl. buildings :				
Customs building, Wellington St., fitting..	6,406 81			6,406 81
Experimental Farm.....	2,775 13	3,023 58		5,798 71
Government workshop, boiler.....	876 32			876 32
Langevin block, boiler.....	937 41			937 41
Labour Dept., fittings, &c.....		3,903 51		3,903 51
Major's Hill Park.....			3,498 56	3,498 56
Military store building.....	40,481 55			40,481 55
National Art Gallery.....	1,005 10			1,005 10
Parliament Buildings and Library.....		7,037 67		7,037 67
Parliament Buildings, &c.: shelving, file cases, &c.....	25,855 60			25,855 60
Post office, &c.....	78 75			78 75
Rideau Hall, fire damages.....		4,222 10		4,222 10
“ fire protection.....	11,797 21			11,797 21
“ repairs and furniture.....		19,204 57		19,204 57
“ snow, \$660; fuel and light, \$8,000; watchman, \$558..			9,218 00	9,218 00
Supreme Court, boiler.....	134 38			134 38
Generally : removal of snow.....			1,319 12	1,319 12
“ repairs and furniture.....		110,279 16		110,279 16
“ grounds.....			5,010 15	5,010 15
“ power for elevator, &c.....			693 34	693 34
“ telephone service.....			7,150 54	7,150 54
Paris, public building.....	11,413 18			11,413 18
Pembroke, public building.....		16 85		16 85
Peterborough, custom house.....		112 45		112 45
“ post office.....		30 90		30 90
Petrolea, public building.....		66 84		66 84
Picton, public building.....	13,146 99	9 00		13,154 99
Port Arthur, immigration building.....		7 50		7 50
“ public building.....		105 49		105 49
Port Colborne, public building.....		27 22		27 22
Port Hope, public building.....		572 70		572 70
Prescott, post office.....		78 61		78 61
Rat Portage, public building..	794 38			794 38
Sarnia, public building.....	8,869 02	4 50		8,873 52
Smith's Falls, public building..		29 73		29 73
Stratford, public building.....		190 48		190 48
Strathroy, public building.....		10 00		10 00
St. Catharines, drill hall.....	1,828 15			1,828 15
“ public building..		462 10		462 10
St. Thomas, drill hall.....	4,111 24			4,111 24
“ public building.....		213 87		213 87
Toronto, custom house.....	4,241 33	149 40	74 35	4,465 08
“ drill hall.....		884 64		884 64
“ engineer's office.....		0 65		0 65
“ examining warehouse.....		434 90		434 90
“ inland revenue.....		254 28		254 28
“ post office.....	9,797 72	192 71		9,990 43
“ Union Station.....	16,604 80			16,604 80
“ “ power for elevators, &c..			377 65	377 65
“ Receiver General's Office..		2 95		2 95
Trenton, public building.....		48 50		48 50
Carried forward.....	238,910 16	165,485 77	27,341 71	431,737 64



## SESSIONAL PAPER No. 19

## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Construc- tion and Improve- ments.	Repairs and Furniture.	Staff and Main- tenance.	Total.
PUBLIC BUILDINGS—Continued.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward....	238,910 16	165,485 77	27,341 71	431,737 64
Ontario—Con.				
Walkerton, public building.....		39 95		39 95
Windsor, drill hall.....	14,969 92			14,969 92
" public building.....		314 32		314 32
Woodstock, public building.....	22,046 29			22,046 29
Zurich, post office.....		1 75		1 75
Heating, lighting, water, &c., for all buildings in Ontario. (For details see page 24).....			160,320 78	160,500 77
Totals, Ontario.....	275,926 37	165,841 79	187 662 49	629,610 64
Manitoba.				
Brandon, experimental farm.....	243 30	258 93		502 23
" public building.....		181 53		181 53
Dauphin, Dominion lands office.....		16 00		16 00
" immigration building.....		87 19		87 19
Portage la Prairie, public building.....		64 57		64 57
Selkirk, immigration building.....		98 98		98 98
Swan River, immigration building.....	51 90			51 90
Winnipeg, clerk of works office.....		191 50		191 50
" Crown timber office.....		44 54		44 54
" custom house.....		980 14		980 14
" Dominion lands office.....		348 12		348 12
" examining warehouse.....		107 65		107 65
" immigration building.....		270 88		270 88
" post office.....	1,514 00	4,022 43		5,536 43
Manitoba public buildings generally.....			44 71	44 71
Heating, lighting, water, &c., for all buildings in Manitoba (For details see page 24).....			15,937 50	15,937 50
Totals, Manitoba.....	1,809 20	6,672 46	15,982 21	24,463 87
N. W. Territories.				
Battleford, registrar's house.....		1,071 00		1,071 00
" registry office.....		17 75		17 75
Calgary, court house.....		1,640 20		1,640 20
" custom house.....	664 06			664 06
" immigration building.....		259 80		259 80
" land and registry office.....		4 40		4 40
" post office.....		75 74		75 74
Carnduff, court house.....	78 12			78 12
Edmonton, Dominion lands, &c.....		75 75		75 75
" immigrant shed.....		4 50		4 50
" post office.....		74 80		74 80
Indian Head, experimental farm.....	27 71	976 34		1,004 05
Lethbridge, court house.....		18 00		18 00
" immigration building.....		2 81		2 81
" lands office.....		2 50		2 50
" post office.....		90 36		90 36
Macleod, court house.....		15 50		15 50
" custom house.....		40 00		40 00
Medicine Hat, court house.....	1,157 00			1,157 00
Moose Jaw, court house.....		60 00		60 00
Moosomin, barracks.....		6 00		6 00
" court house.....		122 82		122 82
Prince Albert, court house.....	755 70	92 50		848 20
" immigration building.....		89 15		89 15
" land titles and registry.....		75 00		75 00
Carried forward.....	2,682 59	4,814 92		7,497 51



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## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Construction and Improvements.	Repairs and Furniture.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<b>PUBLIC BUILDINGS—Concluded.</b>				
Brought forward.....	2,682 59	4,814 92	.....	7,497 51
<i>N. W. Territories—Con.</i>				
Prince Albert, post office.....		3 00	.....	3 00
Regina, court house.....		545 58	.....	545 58
" Dominion lands..		2 00	.....	2 00
" government house.....		7,644 85	.....	7,644 85
" land titles office.....	14,549 43	.....	.....	14,549 43
" mounted police barracks.....	6,688 00	.....	.....	6,688 00
" post office.....		239 81	.....	239 81
" N.W. Govt. bldgs., renewals, &c., paid N.W.T.....		1,773 87	.....	1,773 87
Rosthern, immigration hall.....		149 60	.....	149 60
St. Mary's, custom house.....		370 00	.....	370 00
Strathcona, immigration building.....	3,015 70	.....	.....	3,015 70
Yorkton, immigration building.....		8 90	.....	8 90
N.W.T., public buildings generally.....		.....	288 00	288 00
Heating, lighting, water, &c., for all buildings in N.W.T. (For details see page 25).....		.....	13,272 90	13,272 90
Totals, North-West Territories.....	26,935 72	15,552 53	13,560 90	56,049 15
<i>British Columbia.</i>				
Agassiz, experimental farm.....	510 53	11 45	.....	521 98
Kamloops, public building.....	7,521 36	31 55	.....	7,552 91
Nanaimo, public building.....	.....	549 60	.....	549 60
Nelson, public building.....	2,882 38	.....	.....	2,882 38
New Westminster, Dominion lands.....		3 00	.....	3 00
" fishery office.....		3 55	.....	3 55
" public building.....	35,098 50	341 30	.....	35,439 80
Rosslund, public building.....	17,420 07	.....	.....	17,420 07
Vancouver, drill hall.....	47,830 00	.....	.....	47,830 00
" public building.....	.....	1,818 21	16 87	1,835 08
Victoria, clerk of works office.....	.....	42 25	.....	42 25
" drill hall.....	.....	39 00	.....	39 00
" marine hospital.....	.....	4 00	.....	4 00
" public building.....	2,476 89	3,610 50	519 09	6,606 48
Williams Head, quarantine.....	.....	4,442 26	.....	4,442 26
British Columbia, buildings generally.....	.....	.....	235 82	235 82
Heating, lighting, water, &c., for all buildings in British Columbia. (For details see page 26).....	.....	.....	14,691 91	14,691 91
Totals, British Columbia.....	113,739 73	10,896 67	15,463 69	140,100 09
<i>Yukon.</i>	81,276 08	7,671 84	38,805 28	127,753 80
<i>Public Buildings Generally.</i>				
Travelling, stationery, instruments, printing, &c.....	.....	.....	7,665 35	7,665 35
Salaries of clerks of works, assts., &c.....	.....	.....	8,985 76	8,985 76



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## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
HARBOURS AND RIVERS.					
<i>Nova Scotia.</i>					
Abbott's Harbour.....		1,200 00			1,200 00
Advocate Harbour.....		431 82			431 82
Argyle Sound.....		500 00			500 00
Arisaig.....			292 19		292 19
Avonport.....			998 90		998 90
Barrington.....			249 26		249 26
" Head.....		1,832 22			1,832 22
Bass Pond.....			49 33		49 33
Bayfield.....			46 50		46 50
Bear Point.....		1,845 60			1,845 60
Beaver River.....		1,080 04			1,080 04
Big Bras d'Or.....			597 71		597 71
Black Point Wharf.....		1,826 40			1,826 40
Blue Rock Breakwater..			1,971 81		1,971 81
Boularderie Centre.....		165 94			165 94
Broad Cove.....			499 93		499 93
Canada Creek.....		1,928 09			1,928 09
Cape Cove.....			750 99		750 99
Cape Negro Island.....			271 69		271 69
Caribou Island.....		1,305 60			1,305 60
Chebogue.....		1,798 34			1,798 34
Chegoggin.....		692 21	88 03		780 24
Chester.....		250 00			250 00
Cheticamp.....			302 50		302 50
Chipman Brook.....		1,485 47			1,485 47
Church Point.....			116 69		116 69
Clark's Harbour.....		3,711 63			3,711 63
Clementsport.....		500 05			500 05
Coffin's Landing.....			23 72		23 72
Comeau's Hill.....		1,000 00			1,000 00
Comeauville.....			4,346 02		4,346 02
Cook's Cove.....	5,625 21				5,625 21
Cow Bay (Port Morien).....			6,965 09		6,965 09
Cribbin's Point.....	1,604 44		3,079 98		4,684 42
Digby.....			2,000 00		2,000 00
Eagle Head.....			3,388 13		3,388 13
East Chezzetcook.....		1,729 45			1,729 45
East Port Medway.....		1,669 25			1,669 25
Eastern Passage (Halifax).....		2,000 00			2,000 00
Ecum Secum.....		99 30			99 30
Englishtown (St. Ann's).....		2,836 08			2,836 08
Eskasoni.....		64 07			64 07
Fox Island (Laurencetown).....			1,243 63		1,243 63
Friars' Head.....		494 50			494 50
Gabarus Bay.....		179 65			179 65
Georgeville.....			291 23		291 23
Grand Narrows.....			147 68		147 68
Great Village Wharf.....			239 58		239 58
Halifax Graving Dock.....				10,000 00	10,000 00
Harbourville.....			500 00		500 00
Haulover.....			500 00		500 00
Ingonish (North Bay).....		24,118 00			24,118 00
Irish Cove.....			103 31		103 31
Isaac's Harbour.....		2,971 86			2,971 86
Kemпт Head.....		68 53			68 53
Ketch Harbour.....			87 25		87 25
L'Ardor West.....		485 44			485 44
Little Bras d'Or.....		72 92			72 92
Little Brook.....			279 32		279 32
Livingston's Cove.....		2,822 53			2,822 53
Lockeport.....		1,601 95			1,601 95
Carried forward. . . . .	7,229 00	62,766 94	29,430 47	10,000 00	106,427 06



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PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
HARBOURS AND RIVERS C.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.....	7,229 65	62,766 94	29,430 47	10,000 00	109,427 06
Nova Scotia—Con.					
Louis Head.....			199 76		199 76
Mabou Harbour.....			999 15		999 15
Malignant Cove.....		6,123 64			6,123 64
Margaree Harbour.....		3,695 30			3,695 30
Margaree Island.....		1,205 53			1,205 53
Margaretville.....			499 98		499 98
Medway River (Channel).....		497 11			497 11
Merigomish.....			216 40		216 40
Meteghan Cove.....		3,499 95			3,499 95
Meteghan River.....		8,848 55			8,848 55
McNair's Cove.....			1,198 71		1,198 71
Milton.....	250 75				250 75
Monk's Head.....			399 96		399 96
Morden.....			3,829 89		3,829 89
Neil's Harbour.....		162 73			162 73
Negro Point.....			325 49		325 49
Newellton.....			50 00		50 00
New Harbour.....		16,162 00			16,162 00
Noel.....			60 15		60 15
North Wallace.....			207 47		207 47
Ogden's Pond.....		2,384 53			2,384 53
Ogilvie Wharf.....			500 00		500 00
Parker's Cove.....		2,891 23			2,891 23
Parrsboro' (Breakwater).....			5,000 00		5,000 00
Parrsboro' (Wharf).....		3,706 64			3,706 64
Partridge Island.....			878 77		878 77
Pereaux.....		14 25			14 25
Petit de Grat.....			500 00		500 00
Pictou Light Beach.....		522 77			522 77
Plympton.....			1,200 00		1,200 00
Porter's Lake.....		8,262 44			8,262 44
Port George.....		2,053 60			2,053 60
Port Hilford.....		5,884 00			5,884 00
Port Hood.....			820 38		820 38
Port Hood Island.....			999 68		999 68
Port Lorne.....			2,186 00		2,186 00
Port Maitland (Yarmouth).....			1,017 66		1,017 66
Ragged Head.....			400 36		400 36
River John.....		1,697 41			1,697 41
St. Mary's River.....	13,204 87				13,204 87
Salmon River (Digby).....		4,723 72			4,723 72
Sanford.....			149 92		149 92
Saulnierville.....			1,999 49		1,999 49
Saw Pit.....			66 23		66 23
Scott's Bay.....			500 00		500 00
Sheet Harbour.....			735 11		735 11
Sight Point (boat harbour).....		500 03			500 03
Somerville.....		2,435 14			2,435 14
Swim's Point.....			241 79		241 79
Tancock.....			515 28		515 28
Three Fathom Harbour.....			595 37		595 37
Tickle Passage.....	5,605 87				5,605 87
Trout Cove.....			1,200 00		1,200 00
Victoria Harbour.....			398 81		398 81
Walton.....			536 82		536 82
West Berlin.....			4 79		4 79
West Chezzetcook.....			496 59		496 59
West Pubnico.....		2,025 01			2,025 01
White Haven.....			1,656 86		1,656 86
Windsor Harbour (dam).....		1,996 10			1,996 10
Carried forward.....	26,291 14	142,058 62	60,047 34	10,000 00	238,397 10



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PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total
HARBOURS AND RIVERS <i>Con.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.....	26,291 14	142,058 62	60,047 34	10,000 00	238,397 10
<i>Nova Scotia—Con.</i>					
Wolfville.....		6,360 50			6,360 50
Yarmouth Bar.....			363 38		363 38
Yarmouth Harbour.....	6,761 93	3,026 32			9,788 25
Generally, Nova Scotia.....				1,648 24	1,648 24
Totals, Nova Scotia.....	23,053 07	151,445 44	60,410 72	11,648 24	256,557 47
<i>Prince Edward Island.</i>					
Annandale.....		1,250 61			1,250 61
Bay View.....	2,721 99		500 00		3,221 99
Brae.....			65 45		65 45
Campbell's Cove.....		4,878 22			4,878 22
Canoe Cove.....		2,804 45			2,804 45
China Point.....			36 00		36 00
Crapaud.....		1,197 63			1,197 63
Hurd's Point.....			499 46		499 46
Miminigash.....			1,196 93		1,196 93
New London.....	11,601 50		312 58		11,914 08
Pinette.....			496 24		496 24
Rustico.....			1,667 02		1,667 02
Rustico South.....			504 56		504 56
Souris (Knight's Point).....		3,766 33	1,245 11		5,011 44
Summerside.....	3,478 70	42 60			3,521 30
Tignish.....		1,992 00			1,992 00
Wedlocks.....	908 39				908 39
West Point.....		2,325 90			2,325 90
Wood Islands.....		1,526 15			1,526 15
Harbours generally (P.E.I.).....				3,948 33	3,948 33
Totals, P. E. Island.....	18,710 58	19,783 89	6,523 35	3,948 33	48,969 15
<i>New Brunswick.</i>					
Anderson's Hollow.....			597 40		597 40
Back Bay.....		179 54			179 54
Bay du Vin.....		778 14			778 14
Belleisle.....	2,735 39				2,735 39
Black Brook.....		1,785 26			1,785 26
Buctouche.....			556 63		556 63
Burnt Church.....		7,549 00			7,549 00
Burying Island (Canso).....		34 60			34 60
Campobello (Wilson's Beach).....			14,457 15		14,457 15
Cape Tormentine.....			13,986 22		13,986 22
Chance Harbour.....		190 55			190 55
Chatham Wharf.....			2,999 84		2,999 84
Chipman & Briggs' Corner.....	4,016 19				4,016 19
Clifton (Stonehaven).....		4,326 51			4,326 51
Cocagne.....			181 00		181 00
Dalhousie.....			699 08		699 08
Dipper Harbour.....		1,039 93			1,039 93
Dorchester.....		212 68			212 68
Edgett's Landing.....			284 86		284 86
French Lake.....	4,253 23				4,253 23
Grande Anse.....		1,464 39			1,464 39
Hopewell Cape.....		1,982 75	1,500 00		3,482 75
Jemseg.....	164 91				164 91
Lameque (Shippegan).....		1,722 00			1,722 00
Letite (St. George).....		396 70			396 70
Carried forward.....	11,169 72	21,627 45	35,296 78		68,093 95



Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
HARBOURS AND RIVERS <i>Con.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.... ..	11,169 72	21,627 45	35,296 78	.....	68,093 95
<i>New Brunswick—Con.</i>					
L'Etang..... ..		346 73			346 73
Lord's Cove (Deer Island).... ..		1,000 00			1,000 00
Lower Neguac..... ..		267 50			267 50
Main River Bridge..... ..		335 40			335 40
Maugerville (Bent's Wharf).. ..	349 02				349 02
Mispec..... ..		980 38			980 38
Oromocto Shoal..... ..	8,184 20				8,184 20
Point du Chêne..... ..			25 00		25 00
Point Wolfe..... ..		184 57			184 57
Quaco..... ..			420 95		420 95
Richibucto..... ..			16,822 66		16,822 66
River St. John and tributaries.... ..		3,228 44			3,228 44
St. John (Negro Point).... ..		7,689 70			7,689 70
St. John Harbour (Fort Dufferin).. ..		1,899 92			1,899 92
St. John (Hilyard Bros.).... ..	272 12				272 12
" (I. C. Ry. Wharf).... ..	2,244 82				2,244 82
" (McAvity & Son).... ..	195 74				195 74
St. Louis..... ..			594 96		594 96
St. Nicholas River..... ..		806 52			806 52
Salmon River (Curley's Shoal).... ..	923 55				923 55
Salmon River (Ward's Shoal).. ..	1,121 34				1,121 34
Shepody River..... ..		71 64			71 64
Shippegan Harbour..... ..		6,814 94			6,814 94
South Ingonish..... ..			30 58		30 58
Spring Hill..... ..	3,134 16				3,134 16
Tracadie..... ..		1,192 96			1,192 96
Tynemouth Creek..... ..			300 00		300 00
Upper Gagetown..... ..	1,332 02				1,332 02
Upper Salmon River..... ..			364 40		364 40
Upper Sheffield..... ..	512 87				512 87
Washademoak..... ..	1,959 24				1,959 24
Generally, New Brunswick..... ..				1,648 23	1,648 23
Totals, New Brunswick....	31,398 80	46,446 15	53,855 33	1,648 23	123,348 51
<i>Quebec.</i>					
Amherst..... ..		3,741 31			3,741 31
Anse à Beaufile..... ..		1,999 99			1,999 99
Anse aux Gascons..... ..		1,299 34	103 15		1,402 49
Baie St. Paul..... ..		2,000 00	841 82		2,841 82
Batiscan..... ..	2,008 00				2,008 00
Beauport..... ..	1,008 25	4,494 75			5,503 00
Berthier (en bas)..... ..		5,600 00	974 91		6,574 91
Bie..... ..		1,541 39			1,541 39
Buckingham..... ..	130 15				130 15
Cacouna..... ..		2,083 82	100 00		2,183 82
Cap de la Madeleine..... ..			49 67		49 67
Cap Sable..... ..		4,046 43	150 00		4,196 43
Carleton..... ..		7,399 22			7,399 22
Cedars..... ..		2,768 40			2,768 40
Chicoutimi..... ..			1,012 12		1,012 12
Coteau du Lac..... ..		2,728 54			2,728 54
Coteau Landing..... ..	1,769 82				1,769 82
Cote Ste. Catherine..... ..			436 64		436 64
East Templeton..... ..	85 00				85 00
Etang du Nord..... ..			16 00		16 00
Father Point..... ..		3,402 13			3,402 13
Gatineau River..... ..	771 25	2,787 26			3,558 51
Carr ed forward..... ..	5,773 37	45,902 58	3,684 31		55,360 26



## SESSIONAL PAPER No. 19

## PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
HARBOURS AND RIVERS—Con.					
Brought forward....	5,773 37	45,902 58	3,684 31		55,360 26
Quebec—Con.					
Georgeville....			161 51		161 51
Graham....	6,707 50	3,999 87			10,707 37
Grande Bergeronnes....			203 12		203 12
Grand Entree....		2,284 37			2,284 37
Grande Rivière....			21 00		21 00
Grande Vallée....		233 15			233 15
Greece's Point....		1,953 70			1,953 70
Grosse Isle....			1,258 15		1,258 15
" (west wharf)....			571 35		571 35
House Harbour....		833 10			833 10
Hull....		9,865 12			9,865 12
Iberville....	283 33		17 48		300 81
Ile aux Grues....		236 81			236 81
Ile Perrot (south)....			876 04		876 04
Ile Verte (Rivière des Vases)....		4,559 02	499 60		5,058 62
Kamouraska....		4,374 38			4,374 38
Lake Megantic....			2,051 32		2,051 32
Lake St. John....		1,749 83		250 00	1,999 83
Les Boules....		2,352 73			2,352 73
Les Eboulements....			444 72		444 72
Levis Graving Dock....		75,150 64		8,767 27	83,917 91
L'Islet....		975 34			975 34
Longueuil....	2,264 00		2,521 89		4,785 89
Lotbinière....	52 00		111 46		163 46
Louiseville....	1,160 50				1,160 50
Lower St. Lawrence....		2,853 83			2,853 83
Magdalen Islands....		3,088 26			3,088 26
Matane....		3,951 08			3,951 08
Montreal Harbour....		49,296 45			49,296 45
Murray Bay....		4,879 94	290 37		5,170 31
New Carlisle....			506 81		506 81
Newport....		4,655 29			4,655 29
Nicolet....	4,989 50		2,499 69		7,489 19
Ottawa River....	500 99				500 99
Percé (North Cove)....		4,167 85			4,167 85
Petites Bergeronnes....			308 25		308 25
Piers below Quebec....			311 98		311 98
Pointe aux Esquimaux....			700 61		700 61
Pointe Claire....			215 35		215 35
Pointe Valois....			805 60		805 60
Port Lewis....			25 00		25 00
Rimouski....			7,514 19		7,514 19
Rivière à la Pipe....		1,214 58			1,214 58
Rivière au Renard....		2,013 36			2,013 36
Rivière Batiscan....	10,488 28				10,488 28
Rivière Cap de Chatte....		830 79			830 79
Rivière Chateauguay....	5,323 50				5,323 50
Rivière du Lièvre....	12,741 55				12,741 55
" " " Lock....			216 70	902 00	1,118 70
Rivière du Loup (en haut)....	1,885 00				1,885 00
Rivière du Sud....		1,438 64			1,438 64
Rivière Ouelle....			288 16		288 16
Rivière Richelieu....	1,876 67	1,504 45			3,381 12
" " (Belœil)....		757 19			757 19
River St. Lawrence (Berthier and Montreal)....	5,835 49				5,835 49
River St. Lawrence (Sorel and Berthier)....	358 40				358 40
River St. Lawrence (Ship Channel)....		432,557 69			432,557 69
Carried forward....	69,210 08	667,689 04	26,104 66	9,919 27	763,994 05



1-2 EDWARD VII., A. 1902

PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
HARBOURS AND RIVERS— <i>Con.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.... ..	60,240 08	667,680 04	26,104 66	9,919 27	763,994 05
Quebec— <i>Con.</i>					
River St. Maurice.... ..	9,598 29				9,598 29
Roberval.... ..		9,747 82			9,747 82
St. Alexis, Baie des Ha-Ha..		4,012 03			4,012 03
St. Alphonse, Bagotville....			499 15		499 15
St. André, Kamouraska....		4,048 79			4,048 79
Ste. Anne de Bellevue....			85 10		85 10
Ste. Anne de la Pérade..			1,199 21		1,199 21
Ste. Anne de la Pocatière....			999 67		999 67
Ste. Anne de Sorel....		2,028 89			2,028 89
Ste. Anne du Saguenay....		2,507 36			2,507 36
Ste. Emélie....		4,843 91			4,843 91
St. Felicien....		315 50			315 50
Ste. Fulgence....		1,500 02			1,500 02
Ste. Irenée....			15 00		15 00
St. Jean d'Orléans....	862 74				862 74
St. Jérôme (Lake St. John)....		6,933 90			6,933 90
St. Johns....	296 34				296 34
St. Lambert....		9,993 05			9,993 05
St. Laurent....			1,607 36		1,607 36
St. Louis River (head gate)....				124 00	124 00
St. Mathias....		1,073 55			1,073 55
St. Michel, Bellechasse....	6,054 06		1,003 48		7,057 54
St. Nicholas....	255 35	3,143 58			3,398 93
St. Paul, Ile aux Noix....			66 50		66 50
St. Roch des Aulnais....		2,443 15			2,443 15
St. Timothée....			47 91		47 91
Sabrevois....		2,090 76			2,090 76
Sorel (ice piers)....		8,111 66			8,111 66
"		624 54			624 54
Tadousac....			2,053 37		2,053 37
Temiscouata Lake (piers)....		1,068 37			1,068 37
Tikonabé....		215 00			215 00
Valleyfield....	2,878 26				2,878 26
Verdun....			107 66		107 66
Yamaska....	2,600 57				2,600 57
" (lock and dam)....		3,000 00	97 16	1,337 22	4,434 33
Generally Province of Quebec..	6,175 74			6,512 04	12,687 78
Totals, Quebec....	88,961 43	735,381 92	33,886 23	17,892 53	876,122 11
Ontario.					
Bayfield....		1,620 46			1,620 46
Belleville....	1,009 63				1,009 63
Bowmanville....		2,991 43			2,991 43
Brenté....		5,000 02			5,000 02
Bruce Mines....		11,760 62			11,760 62
Burlington Channel....	873 00		2,983 53	1,640 18	5,496 76
Cobourg....			5,009 04		5,009 04
Collingwood....	2,830 22	89,970 76	10 00		92,810 98
Colpoy's Bay....		596 41			596 41
Depot Harbour....		779 33			779 33
Desbarats....		942 24			942 24
Deseronto....	480 50				480 50
Goderich....	12,934 65	40,844 45			53,839 10
Hamilton....	121 25				121 25
Hawkesbury....	5,416 75				5,416 75
"		2,862 95			2,862 95
Hilton....			498 37		498 37
Carried forward. . . . .	23,726 00	157,368 67	8,500 94	1,640 18	191,235 84



SESSIONAL PAPER No. 19

PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
HARBOURS AND RIVERS— <i>Con.</i>					
Brought forward.....	23,726 00	157,368 67	8,500 94	1,640 18	191,235 84
Ontario— <i>Con.</i>					
Julian.....			99 74		99 74
Kincardine.....	2,498 00	1,289 52			3,787 52
Kingston.....	664 65				664 65
Kingston graving dock.....				6,132 75	6,132 75
Kingsville.....			14,989 45		14,989 45
Lake Temiscamingue.....		3,000 22			3,000 22
Lancaster.....		5,013 13			5,013 13
Leamington.....		8,466 11			8,466 11
Lion's Head.....	1,488 10		608 83		2,096 93
Little Current.....		216 77	181 43		398 20
McGregor's Creek.....		5,250 00			5,250 00
Meaford.....		22,914 35			22,914 35
Midland.....	6,694 00				6,694 00
Nation River (North Branch).....		2,500 00			2,500 00
Newcastle.....	130 97				130 97
North Bay.....			3,489 07		3,489 07
Oakville.....			5,019 20		5,019 20
Oshawa.....			7,505 95		7,505 95
Otonabee River.....		2,325 06			2,325 06
Owen Sound.....		9,727 28			9,727 28
Oxenden.....		3,709 09			3,709 09
Pickering.....			2,700 00		2,700 00
Point Pelee Island.....		251 19			251 19
Port Albert.....	7 50		416 34		423 84
Port Arthur.....	3,407 00		271 96		3,678 96
Port Burwell.....		43,945 45			43,945 45
Port Colborne.....		1,271 33			1,271 33
Port Elgin.....	1,500 00	5,775 95			7,275 95
Port Findlay.....		3,885 00			3,885 00
Port Hope.....	2,923 30		2,014 80		4,938 10
Port Rowan.....			1,188 67		1,188 67
Port Stanley.....	511 68		7,114 17		7,625 85
Providence Bay.....		6,144 00			6,144 00
Rainy River.....		4,559 14			4,559 14
River Kaministiquia.....	7,398 95				7,398 95
River Ottawa (Narrows).....		136 50			136 50
River Thames.....	45 14		97 40		142 54
Rondeau.....			9,537 95		9,537 95
Sarnia.....	3,568 27				3,568 27
Saugeen River.....		4,282 54			4,282 54
Sault St. Marie.....		291 00	100 00		391 00
Scugog River.....	1,407 19				1,407 19
Sheguiandah.....		2,964 00			2,964 00
Southampton.....	1,974 00				1,974 00
South Nation River.....	1,515 83	5,017 16			6,532 99
Summerside.....			556 61		556 61
Thornbury.....			999 82		999 82
Toronto, (eastern entrance).....		40,836 60			40,836 60
" (diversion of Don).....		268 77			268 77
Trenton.....	8,507 50				8,507 50
Victoria Harbour.....	1,700 00				1,700 00
Washago Falls.....			20 00		20 00
Warton.....		930 65			930 65
Generally, Ontario.....	8,009 78			5,935 12	13,944 90
Totals, Ontario.....	77,677 86	342,439 48	65,412 38	13,708 05	499,237 77



1-2 EDWARD VII., A. 1902

PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work.	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance	Total
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
HARBOURS AND RIVERS— <i>Con.</i>					
<i>Manitoba.</i>					
Assiniboine River....		184 00			184 00
Gimli.....		1,660 75			1,660 75
Gull Harbour....		2,895 88			2,895 88
Hnausa.....		5,312 68			5,312 68
Lake Manitoba....		18,075 45			18,075 45
Red River....	7,999 75	221 00			8,220 75
Selkirk.....		5,986 18			5,986 18
St. Andrew's Rapids....		15,412 41			15,412 41
Generally, Manitoba.....				3,029 38	3,029 38
Totals, Manitoba..	7,999 75	49,748 35		3,029 38	60,777 48
<i>N. W. Territories.</i>					
Harbours, rivers, &c., generally....				2,492 70	2,492 70
Totals, N.W. Territories....				2,492 70	2,492 70
<i>British Columbia.</i>					
Anderson & Kennedy Lakes ..		2,499 11			2,499 11
Columbia River (above Golden)....		3,242 83			3,242 83
Col. River (Narrows, Upper and Lower Arrow Lakes)..		59 50			59 50
Col. River (protection at Revel- stoke)....		6,053 76			6,053 76
Duncan River....		2,692 17			2,692 17
Esquimalt Graving Dock....				11,831 20	11,831 20
Fraser River....	5,306 27	54,976 44			60,282 71
Nanaimo River....		688 14			688 14
Serpentine River....	5,787 87				5,787 87
Skeena River....		5,801 41			5,801 41
Vancouver Harbour... ..	5,586 74				5,586 74
Victoria Harbour (Dredger rock)..		13,044 77			13,044 77
Victoria Harbour....	3,640 91				3,640 91
Williams Head Wharf, &c..			3,850 17		3,850 17
Generally, British Columbia..				1,845 53	1,845 53
Totals, British Columbia...	20,321 79	89,058 13	3,850 17	13,676 73	126,906 82
<i>Yukon Territory—</i>					
Lewes and Yukon Rivers..		57,166 41			57,166 41
Totals, Yukon..		57,166 41			57,166 41
Harbours and rivers, generally— General expenses of staff, &c....	3,638 55			6,928 06	10,566 61
DREDGES AND DREDGING PLANT.					
Maritime Provinces..		20,844 38	4,687 16		25,531 54
Ontario and Quebec....		57,571 50	15,015 51		72,587 01
British Columbia.....		68,282 96	7,258 41		75,541 37
.....			5,144 88		5,144 88
Totals, dredges....		146,700 84	32,115 96		178,816 80



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PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work	Provisional	Construction and Improvements.	Repairs.	Staff and Maintenance.	Total.	
SLIDES AND BOOMS.						
	\$	cts.	\$	cts.	\$	cts.
Belœil booms.....				120 00		120 00
Ottawa District—						
Ottawa River.....			7,113 19	24,737 36		31,850 55
Black River....		2,537 56				2,537 56
Cheneaux boom, allowance to Improvement Co.....				1,248 65		1,248 65
Coulange River.....			629 71	77 69		707 40
Dumoine River.....			319 42			319 42
Gatineau River.....			677 92	162 82		840 74
Madawaska River..			273 16	36 10		309 26
Petewawa River.....			1,663 66	45 00		1,708 66
St. Maurice District..		95,011 57	3,452 49	16,190 74		114,654 80
Grandes Piles.....			234 75			234 75
Trent and Newcastle.. District....			2,790 34	2,105 32		4,895 66
Yamaska Lock.....				133 00		133 00
Collection of slide and boom dues				1,827 37		1,827 37
Totals, slides and booms.		97,549 13	16,561 41	46,594 05		160,704 62
ROADS AND BRIDGES.						
Quebec.						
Gatineau River bridge....		5,000 00				5,000 00
Ontario.						
Des Joachims, bridge....		23,304 93				23,304 93
Burlington Channel, bridge....		170 94				170 94
Kemptville, bridge....		2,000 00				2,000 00
Ottawa, Chaudiere bridges..		57,885 03	601 88			58,486 91
" Duncan bridge ..			514 50			514 50
" Hull roadway.....			271 97			271 97
" Mackenzie Ave.....			18 52			18 52
" Maria St. bridge..		65,025 58				65,025 58
" Sappers' bridge.....			67 00			67 00
" St. Patrick St. bridge..			24 00			24 00
" Union bridge.....			118 00			118 00
" Wellington St...			6,161 20	1,275 00		7,436 20
Portage du Fort, bridge....		10,442 87				10,442 87
N. W. Territories.						
Battleford, bridge....		3,458 01				3,458 01
Belly River (Pace's Crossing)....		2,000 00				2,000 00
Belly River Bridge (Lethbridge)...			68 80			68 80
Edmonton Bridge.....		31,298 65				31,298 65
Bow River Bridge (Calgary)....			81 70			81 70
Old Man's Riv. Bridge....			1,615 73			1,615 73
Yukon Territory.						
Trails and roads generally.....		46,097 22				46,097 22
Traffic bridges generally.....			172 90			172 90
Totals, roads and bridges.		246,593 23	10,615 14	1,275 00		258,483 37
TELEGRAPH LINES.						
Newfoundland.						
Cape Ray line (subsidy)....				250 00		250 00
Nova Scotia.						
Cape Sable line. ....				37 33		37 33
Cheticamp....		159 27		782 70		941 97
Carried forward.....		159 27		1,066 03		1,225 30



1-2 EDWARD VII., A. 1902

PART II.—STATEMENT A. EXPENDITURE. *Continued.*

Name of Work.	Design.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total.
TELEGRAPH LINES— <i>Continued.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward.....		159 27		1,225 03	1,225 30
Nova Scotia—Con.					
Low Point.....				70 00	70 00
Meat Cove.....		2,127 06		2,461 07	4,588 13
North Sydney and Meat Cove.....		124 49			124 49
P. E. Island.					
Prince Edward Island (subsidiy).....				973 33	973 33
New Brunswick.					
Bay of Fundy.....				1,676 05	1,676 05
Escuminac.....				463 19	463 19
Quebec.					
Anticosti-Gaspé lines.....		884 73		2,259 99	3,144 72
Gaspé and Fox River.....		1,022 00			1,022 00
Grosse Isle.....				730 95	730 95
Isle aux Coudres.....				182 83	182 83
Magdalen Islands.....		1,000 00		2,637 71	3,637 71
North Shore, east of Bersimis.....		60,981 56		5,824 40	66,806 96
North Shore, west of Bersimis.....				3,685 94	3,685 94
St. Paul Islands cable.....				7 50	7 50
Maritime Provs. and Gulf, gener- ally.....				10,213 84	10,213 84
S.S. "Newfield".....				1,174 71	1,174 71
Ontario.					
Peleé Island line.....		5,025 52			5,025 52
N. W. Territories generally.....				16,461 34	16,461 34
British Columbia.					
Alberni-Cape Beale.....				1,181 07	1,181 07
Alberni-Clahoquot.....		1,408 78			1,408 78
Ashcroft-Barkerville.....		10,352 53			10,352 53
Cape Beale.....				3,440 78	3,440 78
Cariboo.....				1,621 71	1,621 71
Golden-Windermere.....		8,000 84		6 41	8,007 25
Kamloops-Nicola Lake.....		223 46		1,008 46	1,231 92
Nanaimo-Comox.....				3,958 96	3,958 96
150-Mile House-Quesnelle, &c.....		3,182 00			3,182 00
Quesnelle-Atlin.....		234,960 95		27,395 49	262,356 44
Vancouver and Salt Spring Island		1,445 33			1,445 33
British Columbia, generally.....				22 17	22 17
Yukon District.					
Bennett-Dawson-Atlin line.....		11,170 85		84,536 86	95,707 71
Dawson-Fort Cudahy.....		12,642 67			12,642 67
Telegraph service generally.....				2,708 53	2,708 53
Totals, telegraphs.....		355,756 76		176,869 82	532,626 58



PART II.—STATEMENT A.—EXPENDITURE—Continued.

Name of Work	Preliminary	Construction and Improvements	Repairs	Staff and Maintenance.	Total.
	\$	\$	\$	\$	\$
MISCELLANEOUS.					
Surveys and inspection.....				552 80	552 80
Public Works agency, B.C.....				1 52	1 52
Mourning decorations on the death of the Queen.....		20,611 89			20,611 89
Statue to Her Majesty.....		1,504 82			1,504 82
Monument to Hon. Alex. MacKenzie.....					
Illumination of Parliament Bldg., return of contingent.....		1,600 00			1,600 00
Gratuity to family F. Ricard.....				1 60	1 60
"    to widow A. Gauvreau.....				1 60	1 60
"    to widow M. Gallagher.....				110 00	110 00
"    to widow J. Boyle.....				100 00	100 00
"    to widow John Redmond.....				80 00	80 00
To recoup J. R. Roy.....				700 00	700 00
Technical books of reference.....		241 83			241 83
Portrait of Her Majesty.....				970 39	970 39
Temporary employees—					
Secretary and accountant staff.....				32,900 23	32,900 23
Chief architect staff.....				26,903 71	26,903 71
Chief engineer staff.....				74,271 43	74,271 43
Supt. telegraphs staff.....				2,000 00	2,000 00
Departmental photographer.....				695 96	695 96
Totals, miscellaneous.....		31,657 74		161,837 70	193,495 44



1-2 EDWARD VII., A. 1902

PART II.—STATEMENT A.—EXPENDITURE—*Concluded.*

Name of Work	Dredging.	Construc- tion and Improve- ments.	Repairs.	Staff and Main- tenance.	Total
Amount in Pounds.	Shillings.	Shillings.	Shillings.	Shillings.	Shillings.
<b>Totals, Public Buildings—</b>					
New Scotia .....		10,475 64	12,582 76	23,593 92	46,652 32
Prince Edward Island .....			1,775 42	5,293 77	7,069 19
New Brunswick .....		20,748 88	13,726 06	19,785 79	54,260 73
Maritime Provinces generally .....			2 67		2 67
Quebec .....		91,290 00	37,362 61	32,742 14	161,394 71
Ontario .....		277,926 47	157,841 79	187,842 48	623,610 74
Manitoba .....		1,809 40	6,672 56	15,982 21	24,464 17
North-west Territories .....		26,925 72	15,772 10	13,560 90	56,258 72
British Columbia .....		113,739 73	10,896 67	15,463 69	140,100 10
Yukon Territory .....		81,276 08	7,671 84	38,805 28	127,753 20
Public Buildings generally .....				16,651 11	16,651 11
<b>Totals, Harbours and Rivers—</b>					
Nova Scotia .....	33,053 07	151,445 44	60,410 72	11,248 24	256,157 47
Prince Edward Island .....	18,710 58	19,783 89	6,523 35	3,948 33	48,966 15
New Brunswick .....	31,798 80	45,446 17	53,855 33	1,648 23	132,748 53
Quebec .....	88,961 43	775,481 92	10,886 78	17,892 53	875,222 66
Ontario .....	77,677 86	342,439 48	65,412 38	13,708 05	499,237 77
Manitoba .....	7,999 75	49,748 35		3,029 38	60,777 48
North-west Territories .....				2,492 70	2,492 70
British Columbia .....	20,321 79	80,058 13	3,850 17	13,676 73	117,906 82
Yukon Territory .....		57,166 41			57,166 41
Harbours and Rivers generally .....	3,638 55			6,228 00	9,866 55
<b>Totals, Bridges and other Structures—</b>		146,700 84	52,115 50		198,816 34
" slides and booms .....		97,549 13	16,561 44	46,594 05	160,704 62
" roads and bridges .....		246,597 27	10,615 14	1,275 00	258,487 41
" telegraph lines .....		355,756 76		176,869 82	532,626 58
" miscellaneous .....		31,657 74		151,857 79	183,515 53
<b>Grand Totals</b>	281,741 85	3,611,923 68	174,731 46	851,276 11	4,929,672 50

(End of Statement A.)



SESSIONAL PAPER No. 19

PART II.—STATEMENT B.— Showing the cost of the following services for each Public Building, viz :

Rent ; Salaries of, and Supplies for, Caretakers, Engineers, &c. ; Heating ; Lighting ; Water ; (the total for each province being carried into Statement "A.")

Name of Building.	Rents.	Salaries of Engineers &c.	Heating.	Lighting.	Water.	Total.
<i>Nova Scotia.</i>						
	\$	\$	\$	\$	\$	\$
	cts.	cts.	cts.	cts.	cts.	cts.
Amherst post office		391 03	284 17	286 77	20 00	981 97
Antigonish		387 23	195 99	159 24	40 00	782 46
Antigonish		368 97	185 25	65 10	10 00	629 32
Antigonish custom house			36 25			36 25
Antigonish post office		00	77 50			78 20
Antigonish savings bank			36 25			36 25
Baddeck post office		195 59	118 00	51 25		364 84
Dartmouth post office		229 13	255 00	125 70	22 10	631 93
Halifax appraiser's office		12 70		34 60	76 11	123 41
Halifax Asst. Receiver General's Office	1,217 40			64 25		1,281 65
Halifax post office				2,422 17	918 60	3,340 83
Halifax Dominion building		2,450 44	980 11	268 40		3,698 95
Halifax savings bank			61 12			61 12
Halifax drill shed		766 83	27 56	11 60		805 33
Halifax engineer's office	262 50					262 50
Halifax custom house	750 00	467 63	200 50	10 20		1,428 33
Halifax municipal hall		550 00	418 64	555 11		1,523 75
Kentville post office, &c.		205 17	151 90			357 07
Liverpool		400 18		101 06	1 00	502 24
Lunenburg		297 70	171 25	147 36	19 60	635 91
New Glasgow post office		281 74	191 20	432 90	100 00	1,005 84
North Sydney		304 21	207 50	349 20	22 00	912 91
Pictou custom house		5 05	149 95	5 10		160 10
Pictou post office		353 04	153 54	222 25	5 08	733 91
Sydney post office		361 95	82 50	573 17	20 00	947 62
Timmins custom house				10 68		10 68
Timmins examining warehouse				7 14		7 14
Timmins post office		331 38	205 25	197 64	30 00	764 27
Windsor drill hall			180 45	5 07		185 52
Windsor Public Building		375 74		207 83	50 00	633 57
Yarmouth post office, &c.		391 43	288 00	433 20	72 00	1,184 63
Totals, Nova Scotia, carried to statement A, page 3.	2,229 90	8,870 73	4,688 12	6,347 22	1,457 95	23,593 92
<i>Prince Edward Island.</i>						
Charlottetown Dominion building		1,735 97	509 70	1,218 80	22 00	3,485 47
Charlottetown engineer's office	150 00					150 00
Montague post office		179 51	67 83	25 38		272 72
Summerside post office		384 27	297 16	136 30		817 73
Totals, Prince Edward Island carried to statement A, page 3.	150 00	2,299 81	874 69	1,378 27	225 00	4,918 77
<i>New Brunswick.</i>						
Bathurst post office, &c.		423 32	431 34	24 50		879 16
Carleton, St. John post office, &c.		91 63	27 95	75 00		194 58
Chatham post office, &c.		302 48	373 78	156 10		832 36
Dalhousie		366 63	254 83	21 20		642 66
Fredericton		392 33	252 65	646 50	18 00	1,309 48
Moncton		378 85	276 00	334 20	190 50	1,079 55
Newcastle		375 70	323 02	240 50		939 22
Portland, St. John, post office.			40 88			40 88
St. John post office		1,845 50	1,237 17	467 99	240 10	3,790 76
Carried forward		4,176 44	3,217 62	1,975 79	688 60	10,058 50







SESSIONAL PAPER No. 19

PART II. STATEMENT B. SUMMARY OF THE DEBTS OF THE GOVERNMENT OF CANADA.  
Public Building, &c.—Continued.

Name of Building.	Rents	Salaries				Total.
		Police	Health	Education	Welfare	
Almonte post office, &c....		374 11	137 00	31 06		542 17
Amherstburg " .....		225 77	78 00	127 95	26 25	757 13
Amherstburg " .....		175 28	230 00	100 00	50 00	755 49
Amherstburg " .....		366 63	100 00	128 63	50 00	807 13
Belleville " .....		573 85	430 10			1,629 46
Berlin " .....		415 63	153 83		13 44	809 01
Brampton " .....		367 33	100 00	187 91		720 84
Brantford " .....		170 94	208 00		34 26	1,236 68
Brookville " .....		300 84	350 14	492 61	170 00	1,405 59
Carleton Place " .....		200 80	100 00	120 50		721 30
Cayuga " .....		77 44		71 48		148 92
Chatham " .....		396 45	100 00	177 99		763 02
Colborne " .....		366 63	173 25		45 50	891 48
Concord " .....		441 00	100 00	600 00	56 25	1,597 25
Dundas " .....		45 76	16 85	70 50		633 11
Georgetown " .....		411 00	168 70	439 97	20 50	1,056 11
Guelph " .....			160 15			263 15
Guelph " .....				141 00	5 00	146 00
Guelph " .....			156 77		4 00	640 13
Guelph " .....			100 00	108 00	37 44	809 80
Hamilton custom house, ..		200 00	21 50	125 64	47 70	744 84
" drill shed, .....		200 00				200 00
" " .....					4 80	4 80
" post office, .....			758 70	1,446 42		3,005 12
Ingersoll " .....			20 00		82 78	875 97
Kentville " .....					25 00	25 00
Kimberley " .....		105 11	100 00	0 40	117 75	713 26
" " .....					25 35	25 35
" drill hall, .....						267 55
" inland revenue office, ..				89 20	79 14	168 34
" " .....		1,000 00				1,000 00
" post office, .....		139 00	246 95		91 38	1,015 38
Niagara Falls " .....		409 00	260 96	243 00	32 50	955 46
Niagara Falls " .....		175 80	100 00		25 00	626 18
London custom house, .....		200 00	531 24	60 00	140 00	2,289 14
" post office, .....		200 00	400 00	714 00		1,869 17
Napanee " .....		400 00	227 50		73 75	867 63
Orangeville post office, .....		100 00	100 00	100 00		776 20
Orillia " .....		183 00	228 07	71 00	32 50	516 12
Ottawa experimental farm, ..			1,043 57			1,146 42
" " .....		300 00	600 00			900 00
" " .....				135 00	34 17	169 17
" parliamentary and departmen- tal buildings, .....		29,562 94	16,996 03	12,500 01		59,063 98
" post office, .....		200 00				3,082 80
" " .....		3,742 68		942 45		10,310 13
" " .....		200 00	725 00	282 06		1,507 06
" " .....		200 00	300 00			500 00
" grounds, .....				1,100 90		1,100 90
Ottawa " .....						
Consul General, Seydlitz, .....	275 00	250 00		2 40		2,777 40
Customs, Ottawa, W. J. J. S., ..	750 00	250 00				1,000 00
French translators' room, .....	420 00			258 30		718 30
Gas inspector's office, .....				4 95		4 95
Geological museum (annex), ..	450 00					640 00
Government marine store, .....						40 00
Interior department (Bank of Ottawa), .....	1,600 00			120 65		1,720 65
Laboratory, Ottawa, .....	602 00					692 00
Militia " (Slater chambers), ..	363 25					363 25
Model room (Slater chambers), ..	1,516 50			20 00		1,536 50
Carried forward, .....	8,571 75	50,608 21	34,695 38	25,777 27	2,670 51	122,422 99



1-2 EDWARD VII., A. 1902

Part II. STATEMENT B.—Showing the cost of the following Services for each Public Building, &c.—*Continued.*

Name of Building	Rents.	Salaries of Engineers, &c.	Heating.	Lighting.	Water.	Total.
<i>Ontario—Con.</i>	<i>\$ cts.</i>	<i>\$ cts.</i>	<i>\$ cts.</i>	<i>\$ cts.</i>	<i>\$ cts.</i>	<i>\$ cts.</i>
Brimley Hall.	8,571 75	50,608 21	54,095 38	25,777 27	2,670 51	122,422 99
Ottawa, rented buildings— <i>Con.</i>						
N.W.M. Police (Slater chambers)...	405 00		40 00			445 00
Post office " " " "	435 00					435 00
Works and Engineer and Department of public works)...	1,445 00	1,276 00	350 00	480 00		3,551 00
Pictou post office.....			68 25			68 25
Peterborough post office.....		401 50	224 72	198 00	28 00	852 22
Peterboro' custom house.....		306 30	158 44	165 45	54 00	684 19
Post office " " " "		323 17	198 64	430 00	75 00	1,026 81
Peterborough " " " "		420 65	200 19	14 37	22 32	656 53
Port Arthur " " " "		303 05	156 00	122 25		581 30
Port Colborne " " " "		252 80		94 95	10 00	357 75
Port Hope " " " "		418 25	223 55	167 90	9 82	819 52
Post office " " " "			80 80	30 35		120 15
" " post office.....		400 00	179 37	217 84	140 00	937 21
Rat Portage post office.....		468 51	300 85	147 47	65 50	1,182 37
Sarnia post office.....					5 83	5 83
St. Charles Falls post office.....		308 00	143 41	93 30	88 36	633 07
Stratford post office, &c.....		606 50	331 78	136 45	63 00	1,137 73
Strathroy " " " "		400 00	164 55	47 50	2 70	614 75
St. Catharines " " " "		400 00	109 26	203 75	39 90	752 91
St. Thomas " " " "		454 30	156 60	433 95	66 44	1,111 29
Toronto civil service examining office..	30 00					30 00
" " use of hall.....	45 00					45 00
" custom house.....		1,330 88	433 21	172 04	85 50	2,021 63
Toronto drill shed.....		1,200 00				1,200 00
" " " " " "		4,521 00	755 95	111 21	76 17	5,464 42
" engineer's office.....	443 00					443 00
" harbour, engineer's office.....			3 00			3 00
" inland revenue office.....		650 45	304 90	45 40	21 80	1,022 62
" post office " " " "	125 00	2,725 43	782 40	2,212 44	251 00	6,797 30
" " " " " "	625 00					625 00
" receiver general.....		358 00		132 75		490 75
" engineer's office.....				12 00		12 00
" steamboat inspector's office.....	225 00					225 00
Trenton post office.....		450 00	164 60	207 50	75 00	897 10
Walkerton " " " "		401 75	217 25	211 60	31 00	861 60
Windsor " " " "		796 41	291 80	725 25	96 00	1,709 46
Total, Ontario, carried to Statement A, page 7.....	12,349 75	69,850 25	41,030 87	33,290 94	3,978 96	160,500 77
<i>Manitoba.</i>						
Brimley post office.....			219 15			219 15
" immigrant building.....			150 78			150 78
" post office, &c.....		650 10	683 50	615 25	100 00	2,098 85
Dauphin post office.....	180 00		64 20			244 20
Dauphin immigrant station.....			16 60			16 60
Manitowish post office.....			133 25			133 25
East Selkirk immigrant hall.....	5 00		232 47			237 47
Portage LaPrairie post office.....		419 90	229 60	205 25		854 75
Winnipeg clerk of works office.....		18 00		7 25		25 25
" customs house.....		472 00	620 06	250 87	66 25	1,409 18
" Dominion lands office.....			272 52	55 54	20 80	349 86
" engineer's office.....	275 75					275 75
" " " " " "		16 00	476 50	5 82		497 32
" " " " " "		15 40	847 45	274 97	185 80	1,323 62
" post office.....		2,550 62	2,712 50	2,067 65	476 17	7,806 94
" storage of exhibits.....	297 50					297 50
Total, Manitoba, carried to Statement A, page 7.....	758 25	4,122 02	6,657 58	3,550 57	842 12	15,937 50



SESSIONAL PAPER No. 19

PART II.—STATEMENT B.—Showing the cost of the following services for each Public Building, &c. *Continued.*

Name of Building.	Rents.	Salaries of engineers, &c.	Heating.	Lighting.	Water.	Total
<i>North-west Territories.</i>	<i>\$ cts.</i>	<i>\$ cts.</i>	<i>\$ cts.</i>	<i>\$ cts.</i>	<i>\$ cts.</i>	<i>\$ cts.</i>
Alameda Dominion lands.	135 00					135 00
" immigrant hall.....	18 00					18 00
Battleford registry office		45 00				45 00
Calgary court house, &c.		540 00	256 28	49 65	204 00	1,149 93
" custom house.....			31 09			31 09
immigrant building.			149 66			149 66
Calgary post office.....		480 00	376 83	512 05	240 00	1,708 88
Edmonton Dominion lands office...		400 00	149 95	43 20		593 15
immigration shed.....	400 00		30 00			430 00
lands office.....	60 00					60 00
registry office		5 45				5 45
" post office.....		8 75		132 00		141 25
Lake Dauphin Dominion lands office.			295 00			295 00
Lethbridge court house & custom house		20 00		62 38	60 00	142 38
" Dominion lands office....		420 00				420 00
buildings		68 06	178 80	40 71		287 57
Lacombe immigrant hall	56 00		12 00			68 00
Macleod court house .....	225 00	17 00	52 00			452 00
Macleod custom house .....			109 50			109 50
Medicine Hat..		609 45	54 00			663 45
Moose Jaw custom house..		401 10	110 00	2 40		513 50
Mossburn		608 10	178 17			786 25
Prince Albert registry office...		400 00	206 25			606 25
" court house and jail. .		19 15				19 15
Qu'Appelle court house. ....			4 00			4 00
Red Deer Dominion lands office....	96 00	26 88	75 17			198 05
Regina clerk of works office.....	97 50					97 50
" court house		883 80	714 25	144 24		1,742 29
" Dominion lands office....	500 00		155 85			655 85
immigrant building..			35 25			35 25
" post office.....			258 40	3 00		261 40
" registry office.....			141 70			141 70
immigrant shed			8 00			8 00
Strathcona Dominion lands office....	48 00					48 00
immigrant shed.			163 25			163 25
Walsley court house		542 60	199 50	15 35		757 40
Yorkton Dominion lands office. .	316 60					316 60
Yorkton immigrant hall		0 50	32 50			33 00
Total North-west Terris.; carried to Statement A, Page 8. ....	1,952 10	5,653 84	3,957 38	1,005 58	794 00	13,272 90

*British Columbia.*

Agassiz Experimental Farm...			60 64			60 64
Atlin, post office. ....		1 00				1 00
Kamloops Dominion Lands Office	180 00					180 00
Nanaimo post office.....		600 60	144 50	222 00	45 00	1,011 50
court house. ....				9 50		9 50
New Westminster acts. office .....		1 30				1 30
New Westminster engineer's office. .	522 00	21 20	7 80	57 23		608 23
post office.....		600 00	153 95	97 42	28 00	879 37
Vancouver custom house.....		4 25		402 37		406 62
drill hall.....			12 03			12 03
examining warehouse. ....	1,430 00			8 48		1,438 48
" post office.....		814 00	394 03	1,359 13	176 85	2,744 01
Victoria drill hall .....			188 84			188 84
military store .....			144 75			144 75
" post office.....		2,468 18	600 16	1,733 01	174 25	4,975 60
" old custom house... ..		638 52		27 42	16 50	682 44
" D. O. C.....			22 30			22 30
Carried forward. ....	2,132 00	5,148 45	1,729 00	3,916 56	440 60	13,366 61



1-2 EDWARD VII., A. 1902

PART II.—STATEMENT B.—Showing the cost of the following services for each Public Building, &c. *Concluded.*

Name of Building.	Rents.	Salaries of engineers, &c.	Heating.	Lighting.	Water.	Total.
<i>British Columbia—Concluded.</i>	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Brought forward. . . . .	2,132 80	5,148 45	1,729 00	3,916 56	440 60	13,366 61
Victoria custom house. . . . .		4 10.	145 38	4 20		153 68
" quarantine station. . . . .			38 00			38 00
William's Head quarantine station. . . . .			1,102 70			1,102 70
British Columbia generally . . . . .		30 92				30 92
Total British Columbia carried to Statement A page 8. . . . .	2,132 00	5,183 47	3,015 08	3,920 76	440 60	14,691 91
<i>Dominion Buildings generally. . . . .</i>		740 20	2,033 87			2,774 07
Totals, generally carried to State- ment A page 8. . . . .		740 20	2,033 87			2,774 07

(End of Statement B.)



SESSIONAL PAPER No. 19

STATEMENT C.— Showing amount loaned by government under the authority of special Acts of Parliament and upon the recommendation of the Minister of Public Works, during the fiscal year 1900-1.

Loaned to Harbour Commissioners of Montreal, for improvement of harbour (Acts 59 Vict., Ch. 10, and 61 Vict., Ch. 47) . . . . .	\$300,000 00
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DEPARTMENT OF PUBLIC WORKS, ACCOUNTANT'S OFFICE, OTTAWA, 26th November, 1901.	A. G. KINGSTON, <i>Accountant.</i>
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PART III

REPORT

ON

PUBLIC BUILDINGS THROUGHOUT THE DOMINION

FOR THE FISCAL YEAR ENDED JUNE 30, 1901

BY THE

CHIEF ARCHITECT







# REPORT OF THE CHIEF ARCHITECT

DEPARTMENT OF PUBLIC WORKS, CANADA,  
CHIEF ARCHITECT'S OFFICE,  
OTTAWA, December 2, 1901.

SIR,—I beg to transmit to you, herewith, my annual report on works in connection with the Dominion Public Buildings, that were executed during the fiscal year ended June 30, 1901.

I have the honour to be, sir,  
Your obedient servant,

D. EWART,  
*Chief Architect.*

FRED. GELINAS, Esq.,  
Secretary,  
Public Works, Ottawa.

## PROVINCE OF PRINCE EDWARD ISLAND.

### MONTAGUE.

#### POST OFFICE.

The culvert was rebuilt, the lot regraded, and new fences, gates, &c., constructed. Some minor changes in interior arrangements were made, and some fittings supplied.

### SUMMERSIDE.

#### PUBLIC BUILDING.

The front entrance steps and external brickwork were repaired; some of the galvanized iron eaves gutters were renovated.

## PROVINCE OF NOVA SCOTIA.

### DARTMOUTH.

#### POST OFFICE.

A new porch was built to north entrance, and the building was draped on occasion of the death of Her Majesty, under the supervision of C. E. W. Dodwell, resident engineer and inspector of buildings, Nova Scotia, Halifax.



1-2 EDWARD VII., A. 1902

## DIGBY.

## PUBLIC BUILDING.

A contract was entered into on October 24, 1900, for the erection of this building on a site bounded on the south by Water street and on the north by the Dominion Atlantic Railway. There will be a main portion 55 feet frontage, by 35 feet in depth, two stories, mansard and basement, excepting the south-east corner, 15 feet square of which is to be carried up a 4-story clock tower, and in the rear a one-story adjunct 37 feet by 22 feet containing the examining warehouse, weights and measures office and mail entrance. The ground floor of the main building is to be devoted to the post office, the first floor to the customs and inland revenue departments, and the attic to the caretaker for living rooms. The walls are to be brick, and the floors, roof, and the greater number of the partitions wood. The roof covering to be slate on slopes, and tar, felt and gravel on decks.

Plans, &c., prepared by this department; clerk of works, David Young; contractor, Jas. Reid.

## HALIFAX.

## DOMINION BUILDING.

The post office lock boxes were painted and varnished; the broken plaster ceiling of the post office was renovated; the walls and ceilings of the parcel room were tinted; some articles of furniture, some linoleum and wire screens to windows were furnished, and repairs were made to plumbing, vault doors, furniture, lock boxes, clocks, wiring and glazing. The building was decorated on the occasion of the return of the Canadian contingent from South Africa, and draped on that of the death of Her Majesty Queen Victoria.

Work supervised by C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

## DRILL HALL.

Some additional gas and electric light fixtures were supplied, some alteration of wiring was done, and the building was draped on the occasion of Her Majesty's death.

Work supervised by C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

## EXAMINING WAREHOUSE.

Repairs were made to glazing, plumbing and goods hoist; and the building was draped on the occasion of Her Majesty's death, under the supervision of C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.

## IMMIGRATION BUILDING.

The caretaker's rooms were painted and tinted, some electric fittings and some hose were supplied, and repairs were made to plaster, plumbing and heating, under the supervision of C. E. W. Dodwell, resident engineer and inspector of public buildings, Nova Scotia, Halifax.



## SESSIONAL PAPER No. 19

## KENTVILLE.

## PUBLIC BUILDING.

Building completed and occupied.

Plans, &c., prepared by this department; clerk of works, L. C. Dodge.

Contractor for the construction of the building, James Reid.

Contractor for the construction of post office fittings, Rhodes, Curry & Co.

Contractor for the construction of heating apparatus, T. P. Calkin.

## SPRINGHILL.

## PUBLIC BUILDING.

On October 24, 1900, a contract was entered into for the erection of this building on the corner of Church and Main streets. It is trapezoidal in outline, with the irregular angles on Main street. The site measures 80 feet on Main street, 75 feet on Church street. The building is to have a main portion of 2 stories, attic and basement trapezoidal on plan, measuring 36 feet on Main street by a depth of 48 feet, and to contain a basement, a ground floor for the post office, a first floor containing 4 room for the customs, and an attic containing 4 rooms for the caretaker. On Charles street is to be a wing with a frontage of 52 feet by a depth of 20 feet 6 inches; of the length, 24 feet is the same height as the main building, which it overlaps 11 feet, and the remainder one story, the former to be devoted to staircase, hall and water-closet, and the latter to examining warehouse and weights and measures office. In the re-entering angle formed on the street corner by the junction of the wing and main building, is to be an octagonal tower 5 stories in height, containing on the ground floor the main entrance, on the first floor a hallway, and on the attic floor a stairs to the upper stages of the tower. The basement of the wing is to accommodate the heating furnaces and the fuel. In the yard is to be a wooden detached water-closet, resting on a stone foundation and having a stone cesspit. The basement walls and the string courses, gable wall and cornice of clock tower, and the main portal to be of stone, the remaining portions of the outer walls being brick. The floors, inside partitions, stairs and roof are to be of wood; the roof covering to be slate, excepting on decks and tower roof, which is to be of metal.

Plans, &c., prepared by this department; clerk of works, D. M. Mattinson; contractor, Jas. Reid.

## PROVINCE OF NEW BRUNSWICK.

## CARLETON (ST. JOHN WEST).

## POST OFFICE.

A concrete floor was laid under the adjunct to prevent the further settling of the building; a new flagstaff and flag were provided; the yard was levelled up with earth and ballast; a new fence was built around the lot; the post office lobby, hall and vestibule were painted, and the flashing on roof repaired. The building was decorated and illuminated on the occasion of the return of the South African contingent, and later, on the death of Her Majesty Queen Victoria, was draped in mourning.

All the foregoing under the supervision of D. H. Waterbury, of this department. St. John, N.B.



1-2 EDWARD VII., A. 1902

## PARTRIDGE ISLAND (ST. JOHN).

## QUARANTINE STATION.

The buildings described in my report of last year are completed, and plans for hot-water heating apparatus prepared for the two detention buildings ; it being intended to heat the hospital building by stoves.

An artesian well has been bored to a depth of 600 feet, and a supply of water too saline for drinking or general household purposes obtained.

Works supervised by D. H. Waterbury, of this department, St. John, N.B.

## PORTLAND (ST. JOHN).

## POST OFFICE.

A new front roof cornice was made and the external woodwork generally repaired. The post office room and store were cleaned and painted. The building was illuminated and decorated for the returning South African contingent, and draped in mourning on the occasion of the death of Her Majesty Queen Victoria.

Supervisor, D. H. Waterbury, of this department, St. John, N.B.

## ST. JOHN.

## CUSTOM HOUSE.

The unfinished mansard of north wing was partitioned and finished as 4 rooms, which were furnished with gas fittings, sink, lavatory, grates, furniture, &c. A small observatory for the Marine Department was built on the deck roof, lighted and furnished. New gasoliers were fitted throughout the building. A space was partitioned off hall, north wing, for janitor's room. A hand lift was put in north wing. The offices of the collectors of customs and revenue, 4 rooms in the north wing, and the main corridor and entrance vestibule were painted. Furniture was supplied several of the offices ; door plates, door springs, locks, &c., were renewed, and repairs were made to metal roofing.

The building was decorated in honour of the return of the South African contingent and draped in commemoration of the death of Her Majesty Queen Victoria.

All the foregoing under the supervision of D. H. Waterbury, of this department, St. John, N.B.

## IMMIGRATION BUILDING.

Plans and specification are prepared and tenders received for this building. The site is irregular in outline, approximating a triangle, the principal angle exceeding a right angle, the acute angles truncated and hypotenuse slightly curved inward. The outline of the lot is similar to that of the building, excepting on the longest side, where the outline of the building consists of a series of salient and re-entrant angles, the former in contact with the boundary. The building is to be of wood resting on a pile foundation, two stories in height, measuring on its two short sides 135 feet and 120 feet respectively, and covering an area of 9,400 square feet. On the ground floor there will be a baggage-room and a dining-room, each 35 feet square ; a disinfecting room, 20 feet by 28 feet ; a sulphur-room, 21 feet 6 inches by 18 feet 6 inches ; a waiting-room, irregular in outline, but of area equal to that of one 50 feet square ; also several offices, viz.: one 12 feet by 18 feet, one 12 feet by 9 feet, five 12 feet by 6 feet, together with a store-room 8 feet 6 inches by 6 feet, five stairways, two lavatory



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rooms and a furnace room. On the first floor are quarters for guardian and matron, dormitories, water-closets, lavatories, &c. Separate quarters, with separate stairways, are provided for married and unmarried men and women.

Plans, &c., prepared by this department.

Work to be supervised by D. H. Waterbury, of this department, St. John, N.B.

## POST OFFICE.

The covering of the deck roof and dormers, the gutters, &c., were renewed in copper, a new bag rack was supplied to post office, a number of floors, the roof cresting and the street letter boxes were painted and repairs and renewals were done to plumbing, gas fitting, electric lighting, electric bells, elevator gear, hose and hose pipes, flag staff and flags, speaking tubes, clock, letter boxes, ventilator top, water conductors, woodwork generally, plastering and furniture. A new stairs to and partition in deck loft were made.

The building was decorated and illuminated in honour of the return of the South African contingent, and on the occasion of the death of Her Majesty it was draped in mourning.

All the foregoing under the supervision of D. H. Waterbury, of this department, St. John, N.B.

## SAVINGS BANK.

New coal vaults were built, the stone and brick walls were pointed and repairs were made to flag-staff, painting, &c. The building was decorated in honour of the return of the African contingent, also drayed in commemoration of the death of the Queen.

The foregoing under the supervision of D. H. Waterbury, of this department, St. John, N.B.

## PROVINCE OF QUEBEC.

## BUCKINGHAM.

## POST OFFICE.

A contract was entered into on September 11, 1900, for the erection of this building on the corner of Main and Denis streets. The building is to be two stories and attic, of brick, on a stone foundation, with wooden floors, partitions and roof, and contains on the ground floor a post office, 25 by 34 feet ; a weights and measures office, 18 feet by 12 feet 6 inches ; two stairways and a large porchway ; on the first floor, five living rooms besides halls, stairs and bathroom ; the attic unfinished and the basement devoted to heating apparatus, fuel, stores, &c.

Plans, &c., prepared by this department ; local clerk of works, A. Labelle ; contractor, L. J. Fauteux.

## DRUMMONDVILLE.

## PUBLIC BUILDING.

On November 22, 1900, a contract was entered into for the erection of this building.

The building is to have a frontage of 51 feet 3 inches by a depth of 30 feet 10 inches, thirteen feet of the frontage by the depth a one-story adjunct and the



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remainder the main building. The main portion is two stories, attic and basement, excepting the main entrance where it is three stories, surmounted by a clock turret with four faces. The walls and chimneys are of brick with stone lintels and sills to openings, and on a stone foundation, the remaining portions being wood. The ground floor of the main portion is to be divided into post office, entrance and stairway, halls and water closets, the first floor into three offices, and the attic into five rooms and a bath-room for the caretaker ; the basement to accommodate the heating apparatus, fuel, &c. The adjunct is to be divided into an examining warehouse and a custom office.

Plans, &c., prepared by this department ; clerk of works, F. X. Lemaire ; contractors, Paquet & Godbout.

## GROSSE ILE.

### QUARANTINE STATION.

A system of water works and drainage was installed in the sick division. Two tanks were housed, and a new pump building was erected in connection with this work. Baths, basins, sinks and water closets were put in the hospitals and officers' dwellings. A new forge was built. The large hospital and the small-pox hospital were re-shingled ; the first-class detention building painted. Repairs were made to the telemoneter, disinfection building, and to the fire-pot of the boiler for pump. Repairs were made to the wood, paint, plaster, and other works of the different buildings. Some carpets and furniture were supplied.

The steamer *Challenger* was overhauled and painted.

Plans and specification prepared by this department.

Waterworks and drainage superintended by John Cowan of this department, Ottawa.

Remaining work supervised by Ph. Béland, clerk of works, Quebec, P.Q.

Contractor for waterworks and drainage, O. Picard & Sons.

## LEVIS.

### CATTLE QUARANTINE.

The caretaker's house was raised one story, shingled and painted inside and out. A new stable for cattle, 50 feet by 25 feet, was built. Old fences were repaired and new fences erected.

### IMMIGRATION BUILDING.

This building was in a very bad state, the frame had to be straightened ; shingles of roof and the clapboard had to be renewed ; a floor and six door sills were put in ; ceilings and inside of walls were sheeted ; the two chimneys were provided with galvanized caps ; fifteen panes of glass were replaced, and the building generally repaired and repainted. A large range was provided for caterer.

Work supervised by Ph. Béland, clerk of work, Quebec, P.Q.

## QUEBEC.

### CITADEL, GOVERNOR GENERAL'S QUARTERS.

A hot water heating apparatus was put in. Defective parts of main roof were recovered with galvanized iron. Eight new batteries were supplied for electric bells.



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The usual cleaning and preparation for His Excellency's annual visit were done. A range was supplied.

Plans and specification for heating apparatus prepared by this department, and work supervised by John Cowan, of this department, Ottawa.

Remaining work superintended by Ph. Béland, clerk of works, Quebec, P.Q.

## CUSTOM HOUSE.

A hard-wood floor was put in the laboratory ; the floor of the cellar was renewed, and repairs were done to other floors. A wicket was cut and a black walnut shelf was put in the door of the stamp-room. The long-room, stamp, toilet and fireman's rooms were papered and painted; 49 panes of glass were replaced. Four electric batteries were supplied. Repairs were made to main water supply pipe and to plumbing of water closets; the tanks were all cleaned, four needed repairs and one was renewed. A new grate was fitted in one boiler, and a new expansion tank was put in. Linoleum was laid in the long-room. The room of the collector, of the assistant collector, and that of Mr. Gouins' were carpeted ; some rugs were supplied. The grounds and trees were attended to. The iron stairs on the wharf were repaired.

The foregoing carried out under the supervision of Ph. Béland, clerk of works, Quebec, P.Q.

## EXAMINING WAREHOUSE.

The entrance pavement was repaired ; the stairs were inclosed with sheeting. One C. I. basin was put in Mr. Davis, room. Broken glass was replaced. The snow was removed from the roof and premises.

Work done under the supervision of Ph. Béland, clerk of works, Quebec, P.Q.

## IMMIGRATION BUILDING, LOUISE EMBANKMENT.

The interior of the building was cleaned and painted, and the matron's rooms were papered. Thirteen new blinds were supplied and painted; fifty-three panes of glass were replaced. Quarters were prepared for the assistant matrons, and an office was partitioned off for the Grand Trunk Railway. Repairs were made to closets and plumbing, and six double lever bibbs were renewed. Linoleum was laid in the room of the immigration agent; fifteen roller blinds were put in the windows of the matron's rooms. Two electric bells and four batteries were installed. One large kitchen range and some furniture were supplied. The verandah and the roofs were painted. Eight iron ladders were placed on the building. The platform, at rear, was patched in places. The water cistern was caulked and repaired, and a new boiler placed in engine room.

Work done under the supervision of Ph. Béland, clerk of works, Que, P.Q.

## MARINE AND IMMIGRATION AGENCY BUILDING.

The drains were opened and cleaned. The plumbing was overhauled, and some new basins were put in. Two hundred and forty feet of fire escape ladder were put on the building. An office was fixed up and painted for the weights and measures; a cupboard, some rugs, carpet, and furniture were supplied. A concrete floor was laid in the cellar to prevent the water at high tides from entering the building. A burnt down shed was rebuilt and painted. The wooden areas in front were taken up and renewed, and some fences were erected.

Work done under the supervision of Ph. Béland, clerk of works, Quebec, P.Q.

## OBSERVATORY.

This building was cleaned, papered and painted.



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## POST OFFICE.

A new tile floor was laid in the lobby. A new brass front was put on the interior letter-drop. The door of the safe was repaired. A hoist was put in between the post office and the postal customs. The ceilings of the lobby and of the wing were repaired. The fireman's quarters were painted. Choked drains were opened and cleaned. Numerous repairs were done to the plumbing; the hot-water pipe was brought to the sink in the porch. A porch was erected in the yard. Repairs were done to the main roof. Nine electric bells and four batteries were installed. Three dozen panes of glass were replaced. Repairs were done to furniture. Some tables, chairs and globes were supplied. The usual spring cleaning was done. The snow was removed from roofs and premises. The building was draped for the funeral of the late Queen.

Work done under the supervision of Ph. Béland, clerk of works, Quebec, P.Q.

Contractor for tile floor, Frs. S. Parent.

## ROLLING MILL, CARTRIDGE FACTORY.

This is to be an addition to the cartridge factory, and is on Arsenal street, back of the foundry and next to the engine-house. It is to be 84 feet long by 30 feet deep; it will have two stories and a garret. The foundations are of masonry, and the front wall, from ground line to window ledge, is of grey granite. The beams are to be of steel, supported at the back by the present stone wall, and at the front by steel columns resting on a stone foundation. The floors, ceilings, roof, &c., are to be of wood; ground floor to be of tamarack blocks resting on end on a concrete foundation. The roof and woodwork of front, except openings, are to be covered with galvanized iron. There is to be an iron circular stair and a freight elevator.

The wall between this building and the foundry—an old fortification wall of the time of the French—was straightened and raised; excavations were made and cavities—old dungeons—were filled in. The masonry of front wall and of the foundations for machinery is completed. A 6-inch tile drain was laid from machine pits to outside wall.

Plans, specification, &c., prepared by this department.

Work superintended by Ph. Béland, clerk of works, Quebec, P.Q.

## TELEGRAPH OFFICE.

A store-room was prepared and fitted on the third flat of the militia stores building for the government telegraphs supplies.

Plans, specification, &c., prepared by this department.

Work superintended by Ph. Béland, clerk of works, Quebec, P.Q.

## HOCHELAGA.

## POST OFFICE.

On February 4, 1901, a contract was entered into for the construction of this building on a site having a frontage of 82 feet 9 inches on St. Catherine street by a depth of 118 feet 9 inches. It is to be 50 feet square and consist of a basement for the heating apparatus and fuel, a ground floor containing the office, entrances, stairways, public lobby, lavatory, &c.; a first floor to be arranged as living apartments for the caretaker, and an unfinished attic. The basement walls, the front wall throughout, inclusive of the portico and steps, the frieze, the string course dividing the ground and first stories, the angle quoins and the chimney shafts are to be stone, while the remainder of the rear and side walls, above basement, are to be of brick. The cornices, dormers, chimney caps, awning in rear and hip and ridge coverings are to be galvanized iron. The floors, stairs and roof are to be wood. The roof covering of slate.

Plans and specification prepared by Messrs. Perrault and Lesage, Montreal, P.Q.

Contractors, Martineau & Sons, Montreal, P.Q.



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## HULL.

## POST OFFICE.

On April 26, 1900, the post office building, together with a large part of the city of Hull, was destroyed by fire, it being the second of the kind and on the same site thus destroyed. Plans were immediately prepared and a contract entered into for the construction of this building on the original site and in accordance with the design of the recent building, somewhat amended.

Plans, &c., prepared and work supervised by this department.

Clerk of works, V. Laflamme.

Contractors, James Bourque and Chas. Lemoine.

## VICTORIAVILLE.

## PUBLIC BUILDING.

This building which was described in my report of last year is completed, fitted up and occupied.

Plans, &c., prepared by this department ; clerk of works, Thomas Baril ; contractors for building and fittings, Paquet & Godbout ; contractor for heating apparatus, Paul Tourigny.

## LACHINE.

## POST OFFICE.

A new metal ceiling has been put up in the post office ; a number of Venetian blinds were supplied ; the walls and ceilings were repaired and kalsomined ; the wood-work was painted ; the electric lighting service was renovated and general repairs were affected, under the supervision of C. Desjardins, clerk of works, Montreal.

## MONTREAL.

## CUSTOM HOUSE.

One of the steam heating boilers being unserviceable was removed and replaced by a new one. Four steam radiators and a stove were supplied. A package delivery system has been installed in the long-room. The floor of the collector's and inspector's rooms were covered with linoleum. A gas stove was supplied to the inspector's office, a number of new gas fixtures were supplied throughout the building, and the gas system and the lighting fixtures of the clock repaired generally. The water supply service was repaired. Some floors in top story were renovated.

Works supervised by C. Desjardins, clerk of works, Montreal.

## EXAMINING WAREHOUSE.

The elevator engines were repaired ; the roofs were painted ; some new gas piping and burners were put in ; repairs were made to the heating apparatus ; new hinges were placed on the large doors ; some pointing was done to outside walls ; the brick-work was repaired ; a large part of the woodwork was repainted ; some ceilings and walls on the third floor were distempered ; some linoleum furnished, and the plastering and glazing repaired generally.

Works supervised by C. Desjardins, clerk of works, Montreal.



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## INLAND REVENUE OFFICES.

The cashier's office was fitted up and furnished. A new safe was supplied. The gas fixtures in the collector's office were repaired, and repairs were made to the water service and plumbing generally.

Works supervised by C. Desjardins, clerk of works, Montreal.

## POST OFFICE.

The original wrought iron pipe furnaces were removed, the space occupied by them being required for post office purposes. A new furnace room was fitted up in the south-eastern angle of the building. Three new cast iron hot water furnaces were installed and connected with the hot water heating system. New cables were furnished the mail hoist, and a new motor to the letter stamping machine. A number of electric lights were installed throughout the offices, and the clock faces and the electric lighting and electric bells systems were repaired generally. A lavatory basin was set up in the dead letter office, in the postmaster's toilet room and in the clerk of works' office. An iron screen was put up in the distribution. A gas stove was fitted up in the postmaster's office.

Works supervised by this department ; clerk of works, C. Desjardins.

## ST. HENRI.

## POST OFFICE.

Some Venetian blinds were supplied ; the exterior of the windows was painted ; the caretaker's apartments were painted and tinted, and some minor repairs to plaster, &c., effected under the supervision of C. Desjardins, clerk of works, Montreal, P.Q.

## PROVINCE OF ONTARIO.

## BROCKVILLE.

## DRILL HALL.

This building which was described in my report of last year is in progress, and is expected to be completed at an early date.

Plans for fittings and heating apparatus are in course of preparation.

Plans, &c., prepared by this department; clerk of works, J. S. Mix; contractor, D. S. Booth, Brockville, Ont.

## DESERONTO.

## PUBLIC BUILDING.

On June 25, 1900, a contract was entered into for construction of this building on a corner of Centre and Main streets. The frontages measure 58 feet on Main street, and 78 feet on Centre street, 40 feet of the latter being the main building, and the remainder a 2 story adjunct. The walls are to be stone, the partitions, floors and roof of wood ; the covering of the main roof deck and of the adjunct to be felt, tar and gravel, the slopes of main roof of slate, and of the tower and dormers galvanized iron. Brick vaults are provided on ground and first floors for post office and customs respectively. The basement of the main building is to contain the heating apparatus; the ground



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floor the post office, entrance (tower) porch, hall, passage and water closets ; the first floor is to contain the customs and inland revenue offices, and the attic the caretaker's apartments. A square tower at the street angle, contains the main entrance, is carried up two stories higher than the main building and finished with a pyramidal roof. The adjunct contains on the ground floor an examining warehouse, a weights and measures office, and a gas inspection office.

Plans, &c., prepared and work superintended by this department.

Clerk of works, John Dalton; contractor, Richard Sheehy.

## DUNDAS.

## ARMOURIES.

On October 24, 1900, a contract was entered into for the erection of this building as an addition to the old wooden drill shed,\* and to be used as armouries and headquarters for the 77th Wentworth militia.

The building is to be 60 feet by 37 feet, two stories with a basement 36 feet by 24 feet and covered by a flat roof. At the right front corner is to be an engaged circular turret 13 feet in diameter, three stories, and basement capped by a conical roof surmounted by a flagstaff. In the basement are to be stairway, furnace room, fuel room and store room; on the ground floor a hallway 12 feet wide, extending across the middle of the building, five armouries each 32 feet by 11 feet, a stairway, hall and water closets, urinals and lavatories, these three last mentioned to be in the circular turret; on the first floor, five rooms each, 22 feet by 11 feet; three for armouries, one for quarter master and one for orderly, a stairway hall, a hallway in middle 28 feet by 12 feet, a balcony 12 feet by 8 feet, opening into drill hall, and the circular turret room for the C. O. The walls are to be brick on a stone foundation, the floors, stairs and roof of wood, and the partitions wood and plaster. The roof covering generally is tar, felt and gravel, and the cornices, copings and roof of turret, of sheet metal. It was intended to erect the building on the street line, which was 37 feet from the old structure, but it was afterwards decided to move back the drill shed 37 feet, so as to bring the frontage of armouries to the line of the original front of the old drill shed.

Plans, &c., prepared by this department; resident architect and clerk of works, W. A. Edwards; contractor, Jos. Bowman.

## KINGSTON.

## HOSPITAL BUILDING, FORT FREDERICK.

A contract was entered into on May 1, 1901, for the erection of this building 20 feet eastward of the educational building, to which it is to be connected by a passageway 10 feet broad. The building is to measure 51 feet by 39 feet, and consist of a basement and ground floor, with a mansard attic 37 feet by 39 feet—a portion 14 feet by 39 feet to be covered by a flat roof. The connecting passageway to consist of a basement and ground floor. The walls are to be stone, lined with brick, and the partitions brick, the floors, roof and stairs of wood ; the roof covering of metal and tar and gravel composition. The basement is to contain five rooms, besides a stairway and passages. On the ground floor there is to be a ward 35 feet by 13 feet 9 inches, a mess room, a surgeon's room, a store, closet and bath-rooms, stairway, passages, &c. In the attic is to be a ward 24 feet by 16 feet, a nurse's room, a lavatory, store-room, water-closet, stairway, &c.

Plans, &c., prepared by this department.

Local architect and clerk of works, Arthur Ellis.

Contractors, Sullivan & Langdon.

\*See description in Department Public Works Report 1863-82, page 196.



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## OTTAWA.

## GOVERNMENT HOUSE.

The still-room in basement was enlarged by the addition of the adjoining room, to effect which the brick dividing partition between was removed. The wood flooring of these rooms was removed, a concrete floor covered with one of hardwood laid, the walls were wainscotted, the fittings were altered, some shelving supplied, a new sink and a new range were put in and some tables, &c., supplied. Room No. 29 was fitted up and furnished for use as a store-room for the still-room. To provide a wash-up room to replace that taken to enlarge still-room, a portion of the passage in cook's wing was converted into a room, floored, wainscotted and furnished with sink, draining table, &c. The wooden portion of conservatory was taken down and rebuilt, reusing some of the old heating apparatus material. The building was painted, supplied with cotton blinds and lighted by electric incandescent lighting. The sills and some of the posts of the vinery, being decayed, were taken out and replaced; the roof was straightened and raised, and the sashes were repaired. A system of fire hydrants on the various floors and roofs, with hose, was put in with 6-inch main supply from city supply; several hydrants were distributed through the grounds in the neighbourhood of the building, and a number of chemical fire-extinguishers supplied. A new service of heater and piping to supply hot water to the baths, basins, sinks, &c., of the main house was installed. A water motor was fitted up to work the roasting jack, that driven by smoke having proved unreliable. A large number and considerable length of tile drains were laid throughout the grounds, principally 6-inch and 4-inch, with their accompanying cedar cribs, brick catch basins, &c. Cast-iron soil pipes and waste pipes were laid for coach-house, hall kitchen, hall closets, &c. Painting and distempering were done to about 40 rooms in Hall, besides passages, corridors, &c.; an unusually large number of the rooms and passages were repapered, and a number of the floors oiled.

The cottage was generally repaired, the roof covering of the verandah was renovated, and the building throughout distempered, painted, papered and cleaned to fit it for occupancy of the present secretary of His Excellency.

As the stables were in a dilapidated and unhealthy condition, the interior was in large part renovated and improved; new partitions, concrete floors in stables and coach-house, new water and gas supply pipes, new stalls and new wainscoting were put in, the plastering was repaired, the woodwork throughout repaired and painted, and the windows furnished with roller blinds.

A wooden shed, 30 feet by 12 feet, was built at the lodge.

For the Hall there were supplied 10 tables, 6 screens, 10 wardrobes, 3 cases of drawers, 1 mirror, 3 mirror frames, 2 medicine cupboards, 1 book-case, 7 bedroom baskets, 54 mosquito screens, 12 plant tubs, 232 chairs, 1 umbrella stand, 24 sofas and lounges, 10 cushions, 9 mattresses, 24 pairs of curtains, 16 blinds, 16 hearth rugs, carpets for the principal rooms, napery, loose covers for furniture, glassware, crockery, kitchen utensils, bedroom ware, &c. The carpets, rugs and mats were lifted, cleaned and relaid; a large number of chairs were restuffed and recovered, and repairs made to mattresses and furniture generally.

Some new electric lights were installed in greenhouses, vinery, potting shed and furnace-room. Some new hot-bed frames and sashes were supplied, as well as some melon frames and 2 ladders for vinery and conservatory. The flooring of the root-house was renovated throughout, 2 new ventilating shafts were put in and 3 electric lights. Tar and gravel roof covering was laid on cloak-room, shingle on roofs of kitchen, woodshed, potting shed and tennis court, and the roof of conservatory was recovered with galvanized iron.

Wire trellis was put up in garden for climbing plants, and posts for training roses, &c. One pair of new gates was made and several pairs repaired. A number of new fences were built, and a large quantity of unserviceable fencing taken down and



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rebuilt, as well as some repairs to old but serviceable fencing. Some of hedges were grubbed out, some grading, sodding and tree-planting was done, and the main avenue was gravelled, rolled and otherwise improved. The ice-houses were packed with ice. The roofs, paths, slides, rinks, &c., were cleared of snow by the departmental staff, by whom the grounds, lawns, gardens and plant-houses were maintained.

The usual periodic cleaning and the packing and unpacking were done ; arrangements for and attendance on entertainments were furnished, and the rinks, slides, &c., &c., kept in order.

Work carried out and maintained under the supervision of this department by the departmental staff.

Clerk of works, Wm. M. Hutchison.

## CENSUS BOARD OFFICES.

On December 1, 1900, this building, which is situated on the north side of Sparks and west side of O'Connor streets, was leased for a term of ten years to accommodate the census staff of the Department of Agriculture. As the building was built for and used as a wholesale warehouse, extensive alteration of the interior was necessary. Some of the large spaces were divided into rooms by plastered partitions ; water closets, lavatories, water service and drainage were put in and the heating apparatus altered, added to and in part renovated. All under the supervision of this department.

## MILITARY STORE BUILDING.

This building, which was described in my report of last year, is expected to be completed at an early date. Plans for a hot water heating apparatus and furniture and fitments are being prepared.

Plans, &c., prepared by this department ; clerk of works, P. Canty ; contractors, James Bourque & Chas. Lemoine.

## MAJOR'S HILL PARK.

Plans for the construction of a new conservatory with a greenhouse and potting shed attached are being prepared.

## NORTH-WEST MOUNTED POLICE STOREROOMS.

On March 15, 1900, a lease of five years' duration was entered into for the stone building, 172 Wellington street, to be used as storerooms for the North-west Mounted Police force.

## DEPARTMENT OF CUSTOMS ANNEX—WELLINGTON STREET.

On May 25, 1901, the building known as ' the Nagle Block,' 98 and 100 Wellington street, was rented for a term of ten years from the Ottawa Building Company. Extensive alterations of partitions, walls, windows, doors, &c., were carried out, the heating apparatus was renovated, new plumbing and drainage were installed, and the building was fitted up and furnished as offices throughout.

## PARLIAMENTARY AND DEPARTMENTAL BUILDINGS AND GROUNDS.

A number of new stone roadway crossings were put in ; concrete floors were laid in basements and some brick floors renewed. The external walls were pointed, the skylights were repaired throughout, the lead glazing was extensively renovated, and the



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glazing generally repaired—over 2,200 lights of glass being required. A large number of steel file cases were supplied to the Interior, Finance, Militia, Customs, Mounted Police, Auditor General's, Trade and Commerce and Public Works Departments. Repairs were made to the roofs, seventy-five rooms were cleaned, tinted and painted, fifteen hardwood floors were laid and the clerestory windows and frames at the parliament library were taken out and replaced by others stronger built. Among the articles of furniture supplied were 85 book-cases and cupboards, 65 screens, 15 large desks, 25 step-ladders, 320 chairs, 42 tables, 18 window deflectors, 825 packing cases, 15 hardwood chests, 10 press stands, 8 dozen of newspaper files, 84 sets of map rollers, 25 drawing boards, 85 chair cushions, &c., &c., &c. A large quantity of fittings, such as counters, plan cases, glass partitions, &c., were provided. A large quantity of minor repairs were made to woodwork, glazing, plastering, painting, heating, plumbing, &c., among which may be instanced the repair of 350 pieces of furniture, and the cleaning, oiling and varnishing of 460 pieces.

Of electric lights there were installed 40 with fixtures, 60 with standard lights, and 84 with drop lights; 153 shades were supplied; 40 lights were altered from fixtures to drop lights; 9 offices were rewired for electric bells; 8 offices had the offices rearranged and a number of telephones were wired for. There were furnished and fitted up 10 wash basins, 3 baths, 1 sink, 2 electric fans, 2 gas logs, 1 gas stove, 4 gas lights, 13 steam radiators, 2 lighting arresters, and 1 water closet. Some steampipes were covered and the steel wire cable of the hoists in Langevin Block, aggregating over a mile of  $\frac{3}{4}$ -inch cable, taken out and replaced by new.

On the occasion of the return of the South African contingent the buildings were illuminated with devices, legends and lines of incandescent electric light. They were draped in mourning on the occasion of the death of Her Majesty the Queen.

Works carried out by the departmental staff; Wm. King, mechanical engineer; F. Breton, clerk of works.

#### SURVEYOR GENERAL'S OFFICES.

On May 15, 1901, a lease was entered into with the Ottawa Building Company for a new building on the east side of Metcalfe and north side of Slater streets for a term of ten years.

This building, which was specially constructed to suit the requirements of the Surveyor General, was fitted up and furnished throughout under the supervision of this department.

#### REPAIRING STREETS, ETC.

A new sidewalk was laid on St. Patrick street, from Mackenzie avenue to the river; the coal shed tramway flooring was relaid with plank; St. Patrick street was re-metalled from the Interprovincial bridge to Mackenzie avenue; the plot between the Printing Bureau and St. Patrick street was laid in broken slate; repairs were made to Wellington street roadway, and to the sidewalk on south side of Wellington street, as well as minor repairs to the various sidewalks under the control of the staff.

Scraping, cleaning and minor repairs were done to the various roadways and streets under the control of the department. Rubbish, scrapings and ashes were removed from the east block, west block, parliament buildings, the workshops, printing bureau, the museums and the various streets and deposited at Nepean Point; the grass at geological museum was kept clipped and the ashes removed from the boiler houses; the roadways, sidewalks, footpaths, roofs, and yards were kept clear of snow during the winter.

Work done by the departmental staff; C. Leblanc, foreman.

#### BUILDINGS AND GROUNDS GENERALLY.

In addition to the works mentioned in connection with the various buildings, the property of the government, there are similar works of repair, painting, furnishing,



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tinting, &c., in connection with a number of rented buildings, also such works as repairs to and renewals of coal and other sheds as well as works of a general character, such as the erection and taking down of porches, the winter boarding of outside steps, the moving of furniture, the putting up and taking down of summer blinds and winter sashes, the beating of carpets, minor repairs to glazing, painting, woodwork, furniture, &c., the supplying of packing cases, the removal of the snow from the ground, buildings, roads, foot-paths, which work was done by the departmental staff.

## PARIS.

## PUBLIC BUILDING.

On October 24, 1900, a contract was entered into for the erection and construction of this building on part of lots Nos. 7 and 8 on the westerly side of Grand River street.

The building is to have stone basement, string courses, cornices, window dressings, porches, steps, &c.; the external walls of ground and first floors are otherwise to be of brick. It will consist of a main portion 49 feet frontage by 39 feet 5 inches depth, and contain in the basement accommodation for heating apparatus and fuel, on the ground floor the post office, on the first floor two offices each for the customs and inland revenue departments, as well as lavatory and closet, and in the attic five rooms and bath room for the caretaker. In rear is to be a one story adjunct to contain examining warehouse, weights and measures office and water closets.

Plans for a hot water heating apparatus are being prepared.

Plans, &c., prepared by this department; clerk of works, Duncan Mackay; contractor, Wm. Griffiths.

## PICTON.

## PUBLIC BUILDING.

On August 23, 1900, a contract was entered into for the erection and construction of this building on lot 265 on the northerly side of Main street.

The building will consist of a main portion, 49 feet by 38 feet, two stories, basement and attic, and an adjunct in rear, 29 feet by 27 feet, of one story. The outer walls are to be brick on a stone foundation, the floors, partitions and roofs of wood with roof covering of slate and metal. The main building is to be occupied on the ground floor as a post office, on the first floor as customs and inland revenue offices, and on the attic floor as caretaker's apartments, the basement being for furnaces, fuel and stores. The adjunct is to contain an examining warehouse, a weights and measures office, and a spare office.

Plans, &c., prepared by this department; clerk of works, P. M. Pulver; contractor, Robert Cameron, Almonte.

## PRESCOTT.

## CUSTOM HOUSE.

The town authorities having established a waterworks plant and drainage system, plans and specification for plumbing and water service are being prepared by this department.

## POST OFFICE.

Plans for water service, plumbing, &c., are in preparation, similar to that for the foregoing.



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## ST. THOMAS.

## ARMOURY.

On February 26, 1901, a contract was entered into for the construction of this building on subdivision of the south part of lot No. 3, con. 8, in the township of Yarmouth, situated on the corner of Wilson and Chester streets. The building is to measure 52 feet on Wilson street by 104 feet on Chester street, exclusive of the projections of two angle circular turrets on the Wilson street front. The walls are to be of brick with stone copings, battlements, string courses, plinth, &c., and on a stone basement; the floors, partitions, stairs and roof are to be wood, excepting the basement floor which is to be concrete, the roof principals which are to be combination wood and iron, and the roof covering of galvanized iron. On the ground floor are to be the main entrance, stairway flanked by the quartermaster store and water closet, six armouries, the officers mess, the commandants office and the lavatories; on the first floor is to be a lecture room 75 feet by 41 feet, a sergeant's mess and a band room.

Plans, &c., prepared by this department; clerk of works, N. R. Darrach; contractors, Messrs. Green & Co.

## SARNIA.

## PUBLIC BUILDING.

A contract for the construction of this building on a site on Front, Davis and Talfourd streets was entered into on September 17, 1900. There will be frontages of 90 feet and 42 feet on Front and Davis streets respectively; the extreme length of the building 99 feet, and the extreme depth, inclusive of projection of tower on Front street and of adjunct in rear. It will consist of basement, ground floor, first floor and attic, excepting the tower on Front street, which will have an additional story, and the adjunct in rear one story and basement. There will be two street entrances, one from the middle of the Front street elevation providing a direct entrance to the stairway hall, post office and examining warehouse as well as access to the weights and measures and gas offices in the rear; the other, on the corner of Front and Davis streets opening into the post office lobby. The post office is to be on the corner of Front and Davis streets on the ground floor, measuring 49 feet by 35 feet, and having a brick vault 6 feet by 6 feet, inside dimensions. The entrance porch in tower will be 14 feet 4 inches by 12 feet 4 inches between the post office and examining warehouse, and with the stairway hall in the rear. The examining warehouse will be 32 feet by 20 feet 6 inches, and have a brick vault 5 feet by 5 feet, inside dimensions. Between the post office and the examining warehouse will be the main hall and stairway. Behind the examining warehouse and abutting on main hall from which they are to be entered are to be two lavatory rooms with water closets, and behind these are to be the adjunct containing the offices of the gas inspector and weights and measures inspector, as well as a passage leading to and from main hall. In the tower on the first floor is to be the collector of customs office with the long-room on one side, over the examining warehouse, a customs office on the other side, two offices for the Indian land agent on Davis street, and two offices for the inland revenue department in the rear. The long-room and one of the Indian department offices to have each a brick vault. Behind the long-room, opening on the stairway hall and immediately over those of the ground floor is a lavatory and closet room. That portion of the attic above the post office is unfinished, excepting one small room and a storeroom, which with three rooms above the long-room, a bath room and a lavatory both over the first floor closet room are finished for living apartments for caretaker. The basement will extend under the entire ground floor excepting tower, the portion under the post office and stairway being laid in concrete.



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The basement walls are to be stone; the ground floor walls on Front and Davis streets of stone backed with brick and on the rear of brick; the tower walls to be stone throughout; the first floor and attic walls to be brick excepting cornices, pilasters, architraves, window jambs and other dressings on Front and Davis streets which are to be stone. The floors, roof, stairs, and the larger number of the partitions are to be wood.

The roof of main portion is to be covered with asphalt, and those of the adjunct and tower with metal.

Plans, &c., prepared by this department; clerk of works, Marcus R. Burrows; contractor, Geo. A. Proctor.

## TORONTO.

## POST OFFICE.

*Alteration of and Additions to Newspaper Sorting Room, Union Station.*

A contract for these works was entered into on August 23, 1900.

It is proposed to lengthen the newspaper sorting room 40 feet, reducing the width gradually from 31 feet to 24 feet at the extreme end; also, to build a brick elevator tower, 20 feet square, outside dimensions, by 53 feet in height, to accommodate the elevator for hoisting the mails from the platform to the bridge.

Plans, &c., prepared and work superintended by S. G. Curry, architect, Toronto.

Contractor, John Hanrahan.

## WINDSOR.

## DRILL SHED.

A contract for the construction of this building was entered into August 11, 1900, and is expected to be completed during the fiscal year 1901-2. Plans for a hot-water heating apparatus and for armoury fittings and furniture are being prepared.

Plans, &c., prepared by this department.

Clerk of works, Charles Smith.

Contractors, Sullivan & Langdon.

## WOODSTOCK.

## PUBLIC BUILDING.

This building, which was described in my report of last year, is yet in progress, and is expected to be completed during this calendar year. Plans and specification for hot-water heating apparatus and post office are prepared.

Plans, &c., prepared and work superintended by this department.

Local architect and clerk of works, Alexander White

Contractor, Jos. A. DesRivières.

## PROVINCE OF MANITOBA.

## WINNIPEG.

## CUSTOM HOUSE.

York avenue, in front of building, was asphalted and boulevarded. Two new 'Oxford' hot-water heating furnaces were installed, and some additions made to the



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heating system. A number of the walls and ceilings were papered and kalsomined, and the woodwork painted. Repairs were made to roof, furniture, plumbing, &c., and some articles of fittings and furniture supplied. Work done under the supervision of J. Ernest Cyr, clerk of works, Winnipeg, Man.

## WINNIPEG.

### DOMINION LANDS OFFICE.

Some carpets and wall paper, also a flag staff and ensign were supplied; the furnaces were cleaned and were repaired; a fire-service main, with a hydrant on each floor, was put in, and some repairs done to floors, &c.

Works carried out under the supervision of J. Ernest Cyr, clerk of works, Winnipeg, Man.

### EXAMINING WAREHOUSE.

The furnace was overhauled and improved, and some articles of furniture supplied, under the supervision of J. Ernest Cyr, clerk of works, Winnipeg, Man.

### IMMIGRATION HALL.

Additions were made to the plumbing and electric bell service, and repairs were effected to chimneys, plumbing, steam-fitting, furniture, &c., under the supervision of J. Ernest Cyr, clerk of works, Winnipeg, Man.

### POST OFFICE.

A downward plenum system of ventilation was installed, providing warmed pure air for the ground floor. The interior and exterior woodwork of the building was repainted. A new hoist for the use of mail carriers was put in; the brickwork of one of the boilers was rebuilt. Alterations of and additions to fittings, &c., of post office flat, more especially in general delivery and money order office, were effected, including new lock boxes and a new postal bag rack. Repairs were made to plumbing, elevator, pump, electric wiring, bells, roof, glazing, pumps, &c.

Plans, &c., for ventilation system prepared by this department, and work superintended by J. Cowan, of this department, Ottawa.

Remaining works supervised by J. Ernest Cyr, clerk of works, Winnipeg, Man.

### PUBLIC BUILDINGS GENERALLY.

All the public buildings were draped on the occasion of the death of Her Majesty Queen Victoria.

## NORTHWEST TERRITORIES.

### REGINA, ASSA., WEST.

### DOMINION LANDS AND REGISTRY OFFICE.

This building, which was described in my report of last year, has been completed, fitted up and occupied.

Plans, &c., prepared and work superintended by this department; clerk of works, John Morrison; contractors for construction of this building, Willoughby & Wallis; contractors for hot water heating apparatus, Colter Bros.; contractors for furniture, R. B. Ferguson.



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## STRATHCONA, ALTA.

## IMMIGRATION BUILDING.

This building, which was constructed during the autumn of 1900, is a wooden building set on wooden posts and having two brick chimneys, consists of a main two and a half story portion, 55 feet by 28 feet, and a two-story adjunct in rear, 32 feet by 10 feet. The ground floor has a main staircase hall dividing the agent's office and women's apartment on one side from the men's apartment on the other ; in the rear of the main hall is the kitchen ; in rear of the men's room is the baggage room, and in the rear of the women's room is the woodshed. On the first floor are the dormitories, wash-rooms and storeroom. There is a wooden one-story detached building on posts, 10 feet 6 inches by 15 feet 6 inches for latrines.

Plans, &c., prepared and work superintended by this department ; contractor, Robert John Manson.

## YUKON TERRITORY.

## DAWSON.

## ADMINISTRATION BUILDING.

This building was commenced in June 1900, carried on by day labour continuously, and is expected to be completed in December, 1901. The size of the building is 100 feet by 47 feet, two and a half stories high, and will contain the Recording Office with all other appurtenant thereto, the Commissioner's office and offices of that branch, council chamber, also offices of the Comptroller, Public Works, Law Clerk, Engineer, License Inspector and Tax Collector besides committee rooms. It is a wooden building finished inside in British Columbia fir, oiled and varnished, and the roof covered with galvanized iron. There are to be two brick vaults. Heating is to be by hot air and lighting by electricity.

Plans, &c., prepared and work superintended by this department ; resident architect, T. W. Fuller, of this department, Dawson.

## COURT HOUSE.

This building was commenced during August, 1900, and the foundation put in before the winter set in. On March 13, 1901, the work was resumed, and it is expected to be completed by August 1, 1901. The building is two stories, of wood, the roof covered with galvanized iron. The building measures 80 feet by 44 feet, and will contain on the ground floor the library, the judge's chambers and offices for the judge, sheriff, clerk of the court and stenographer. On the first floor will be two court rooms and rooms for the accommodation of the barristers, jury and witnesses. It will be finished throughout in British Columbia fir, oiled and varnished, be heated by hot air and lighted by electricity. Work done by day labour.

Plans, &c., prepared and work superintended by this department ; resident architect, T. W. Fuller, of this department, Dawson.

## COMMISSIONER'S RESIDENCE.

This building is now in course of erection and is expected to be completed by September, 1901. It is a wooden, two-story and attic building, 45 feet by 50 feet, with a one-story adjunct for use as kitchen and shed. It is to be finished throughout in British Columbia fir, heated with hot air and lighted by electricity.

Plans, &c., prepared and work superintended by this department. resident architect, T. W. Fuller, of this department, Dawson, Y.T.



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## POST OFFICE.

The erection of this building was commenced in May, 1900, and completed in December, 1900. It is a two-story wooden building covered with galvanized iron, measuring 70 feet by 40 feet, with a one-story adjunct 21 feet by 14 feet, and an octangular engaged tower one story higher than the main building. It is to be finished throughout in British Columbia fir, heated with hot air and lighted by electricity. The ground floor of the main building is for the post office and is to contain a large brick vault; the first floor, on which are two brick vaults, is to accommodate the registrar, Crown lands and telegraphs. The adjunct is for examining warehouse and water closets.

Plans, &c., prepared and work superintended by this department; resident architect, T. W. Fuller, of this department, Dawson, Y.T.

## CLEAR CREEK.

## MINING INSPECTOR'S OFFICE.

A small wooden building erected for the accommodation of the mining inspector.

## PROVINCE OF BRITISH COLUMBIA.

## KAMLOOPS.

## PUBLIC BUILDING.

A contract was entered into October 29, 1900, for the erection of this building on lot G, Main street. Dimensions of lot: 52 feet by 125 feet. The present post office stands on property belonging to the government; it was purchased from the Railways and Canals Department, in 1886, by the Department of Indian Affairs.

The building is designed to consist of a two-story, attic and basement main portion, 42 feet frontage by 37 feet depth, and a two-story adjunct in rear, 52 feet deep by 18 feet broad. The basement of the main portion and the foundation of the adjunct are to be of stone; the partitions in basement, the chimney and a vault at the extreme end of the adjunct are to be brick, and the remaining portions of wood. In the main portion, the basement is to be divided into a room for armoury, a furnace room and a stairway hall; the ground floor is to contain the post office, the entrance hall and stairway to upper flats and basement, and a separate rear entrance and stairway to armoury; the first floor is to contain 3 offices for the customs and inland revenue, 2 additional offices and the stairs to attic, which is to be divided into 2 rooms and a storage closet. The adjunct will contain, on the ground floor, an office with a large brick vault for the Indian agent, an office for the weights and measures, and a spare room; on the first floor are to be two spare offices and a brick vault. In the yard is to be a w.c. building, 15 feet by 10 feet, of wood on stone foundation, and with stone cesspit.

Plans and specifications have been prepared and tenders invited for a hot-water heating apparatus.

Clerk of works, Allister Thompson.

Contractor, Robert MacKay.

## NANAIMO.

## PUBLIC BUILDING.

The divisional stone wall in basement was replastered; some furniture was supplied by the Customs Department, and the street letter-boxes were painted. The building was draped on the occasion of the death of Her Majesty the Queen.

Works supervised by Wm. Henderson, of this department, Victoria, B.C.



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## NEW WESTMINSTER.

## PUBLIC BUILDING.

The works in connection with the construction of this building, which was described in my report of last year, are approaching completion, and plans and specification are prepared for a hot-water heating system.

Plans, &c., prepared and work superintended by this department.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

Clerk of works, Alex. Hamilton.

Contractors, Bourque & DesRivières.

## NEW WESTMINSTER.

## TEMPORARY PUBLIC BUILDING.

Two skylights were built in roof ; the resident engineer's office was supplied with furniture ; a new clock was supplied post office ; a new ensign was supplied ; repairs were done to furniture, and carpets were taken up, cleaned and relaid. All under the supervision of Wm. Henderson, of this department, Victoria, B.C.

## NELSON.

## PUBLIC BUILDING.

A contract was entered into January 31, 1901, for the erection of this building on a plot of ground 75 feet by 120 feet, situated at an angle of Vernon and Ward streets, having a frontage of 60 feet on Vernon street, and extending back on Ward street 120 feet, the full depth of the plot. There is to be a main portion, two stories, basement and attic, situated on the angle of Vernon and Ward streets, where there is a turret 14 feet in diameter, octagonal on ground floor and circular on first and attic floors ; and a one-story adjunct on Ward street, extending from the main building to the alley in rear. The ground floor and basement walls are to be of stone, and those of the first floor, attic gables or dormers and upper stage of tower of brick. The partitions, floors and roofs are of wood, the sloping portions of roof to be covered with slate, and the decks with tar and gravel compositions. In the basement are to be the furnaces and fuel ; on the ground floor of the main portion the post office, having an entrance porch on Vernon street, from which is to be reached the octagonal turret containing the stairs to first floor. At the rear of the post office are to be the mail entrance facing the yard, and the customs and inland revenue entrance and stairway facing Ward street ; beyond this, the one-story adjunct containing water-closet room, examining warehouse and gas inspection office. On the first floor of main portion are to be the customs long room, 3 customs offices, 3 inland revenue offices, water-closets and stairs to attic. The attic is to contain 8 rooms and a bath-room for the caretaker.

Plans, &c., prepared by this department ; construction supervised by Wm. Henderson, of this department, Victoria, B.C.

Clerk of works, Jas. Allan Macdonald.

Contractors, Viau & Lemoine.

## ROSSLAND.

## PUBLIC BUILDING.

A contract was entered into on November 3, 1900, for the construction of this building on the corner of Lincoln street and Columbia avenue, to be brick with stone



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dressings, on a stone basement with wooden floors, roof and partitions. It is to consist of a main portion two stories, mansard and basement, 44 feet on Columbia avenue, by 63 feet on Lincoln street, with a porch 16 feet by 14 feet in the middle of the avenue front, and one story adjunct 38 feet 6 inches deep by 23 feet, containing a customs warehouse, a gas inspector's office and the water closets. The main portion will consist of a basement for fuel, furnaces and stores, a ground floor for the post office, customs and inland revenue entrance and stairway, a first floor for the customs and inland revenue offices, closets, &c., and an attic story for caretaker's apartments. The gables and dormers are crow-stepped, the porch and two oriel windows are to be battlemented—all in stone of which material also are to be the arch stones of porch, the lintels and sills of openings and string courses and plinth.

Plans, &c., prepared by this department.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

Clerk of works, R. W. Gregor ; contractor, Thos. Bradbury.

## VANCOUVER.

### DRILL HALL.

This building which was described in my report of last year has since been carried on, and is expected to be completed during the fiscal year, 1901-2. Plans and specification for a hot water heating system for the armouries and alleys are prepared.

Plans, &c., prepared by this department.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

Clerk of works, Thos. McKinnon; contractors, Viau & Lachance.

### PUBLIC BUILDING.

The woodwork of the building throughout as well as the street letter boxes, was repainted or revarnished and the heating pipes bronzed; 10 new drop lights were installed in the post office ; the post office room was entirely repiped for gas, and had new gas fixtures ; new smokestacks were provided for heating furnaces ; the water service was overhauled and repaired; a partition was removed and a doorway built up in the express and parcels post department; fittings and furniture were supplied to the deputy postmaster and to the general office; repairs were done to the plaster and caves-troughs, and the entire building, excepting the basement, was kalsomined.

The building was draped on the occasion of the death of Her Majesty the Queen.

Work supervised by Wm. Henderson, of this department, Victoria, B.C.

## VICTORIA.

### OLD CUSTOM HOUSE.

Repairs were done to portions of the building damaged by fire on August 5, 1900. The whole of the external wood work, including shingles and deck covering, was painted. All under the supervision of Wm. Henderson, of this department, Victoria, B.C.

### PUBLIC BUILDING.

A new electric freight elevator was put up in the examining warehouse; the partition in letter carriers' room in post office was extended; the glass in mail entrance doors was protected by wire netting; 50 lock drawers in post office were increased in size; a label case and a sorting rack were supplied to the post office, and a room in the customs department, damaged by fire, was restored and refurnished. The building was



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draped on the occasion of the death of Her Majesty the Queen. All under the supervision of Wm. Henderson, of this department, Victoria, B.C.

## OLD POST OFFICE.

The whole of the plumbing and drainage was renewed. Six water closets, two urinals, three lavatory basins and two sinks with all necessary water service, waste and drainage pipes, &c., were put in. Ten rooms on the first floor, also the hall and staircase, were painted, papered and varnished. The whole area of the yard was laid in concrete. A coal house, of wood sheeted with galvanized iron was put up for the use of the tenant. A board fence was erected across the rear of the property. The building was draped on the occasion of the death of Her Majesty the Queen.

Works done under the supervision of Wm. Henderson, of this department, Victoria, B.C.

## WILLIAM'S HEAD.

## QUARANTINE STATION.

The roof of the hospital building was repaired and the building was painted inside; the first class detention building was painted outside and in, and a new boiler was put in the steamer *Earl*.

All the foregoing under the supervision of Wm. Henderson, of this department, Victoria, B.C.

## GENERALLY.

On the occasion of the return of the Canadian contingent from South Africa the parliament and departmental buildings at Ottawa were illuminated and decorated. All the public buildings throughout the Dominion were draped in commemoration of the death of Her Majesty Queen Victoria.

Repairs and alterations have been executed and sundry articles of furniture, &c., provided, and cleaning, painting and other improvements carried out in connection with a number of buildings not herein reported.

D. EWART,  
*Chief Architect.*

CHIEF ARCHITECT'S OFFICE  
Ottawa.



DOMINION PUBLIC BUILDINGS

JUNE 30, 1901.

*N.B.—This list only includes those buildings which are under the immediate charge of this department.*

PROVINCE OF NOVA SCOTIA.

Amherst.....	Public Building.
Annapolis.....	do
Antigonish.....	do
Arichat.....	Post Office.
Baddeck.....	Public Building.
Dartmouth.....	Post Office.
Digby.....	Public Building (in progress).
Halifax.....	Dominion Building.
do .....	Drill Hall.
do .....	Examining Warehouse (rented building).
do .....	Immigration Building.
do .....	Quarantine (Lawlor's Island).
Kentville.....	Public Building.
Liverpool.....	Post Office.
Lunenburg.....	Public Building.
Nappan.....	Experimental Farm.
New Glasgow.....	Public Building.
North Sydney.....	do
Pictou.....	Custom House.
do .....	Post Office.
do .....	Quarantine Station.
Springhill.....	Public Building (in progress).
Sydney.....	Public Building.
do .....	Quarantine Station.
Truro.....	Public Building.
Windsor.....	do
do .....	Drill Hall.
Yarmouth.....	Public Building.

PROVINCE OF PRINCE EDWARD ISLAND.

Charlottetown.....	Dominion Building.
do .....	Quarantine Station (South Port).
Montague.....	Post Office.
Summerside.....	Public Building.

PROVINCE OF NEW BRUNSWICK.

Bathurst.....	Public Building.
Carleton.....	Post Office.
Chatham.....	Public Building.
Dalhousie.....	Post Office.
Fredericton.....	Public Building.



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Middle Island.....	Quarantine.
Moncton.....	Public Building.
Newcastle.....	do
Portland.....	Post Office.
St. John.....	Custom House.
do .....	Drill Hall.
do .....	Immigration Building (in progress).
do .....	Post Office.
do .....	Quarantine (Partridge Island).
do .....	Savings Bank.
St. Stephen.....	Public Building.
Sussex.....	do
Tracadie.....	Lazaretto.
Woodstock.....	Public Building.

## PROVINCE OF QUEBEC.

Aylmer.....	Post Office.
Berthierville.....	do
Buckingham.....	do (in progress).
Coaticook.....	Public Building.
Drummondville .....	Public Building (in progress).
Dundee.....	Custom House.
Fraserville.....	Public Building.
Farnham.....	Post Office.
Grosse Ile.....	Quarantine Station.
Hochelaga.....	Post Office (in progress).
Hull.....	do (in progress).
Joliette.....	Public Building.
Lachine.....	Post Office.
Laprairie.....	do
Lévis.....	Immigration Shed.
Montmagny.....	Post Office.
Montreal.....	Custom House.
do .....	Drill Hall.
do .....	Examining Warehouse.
do .....	Inland Revenue Building.
do .....	Post Office.
Quebec.....	Cartridge Factory.
do .....	Citadel.
do .....	Custom House.
do .....	Drill Hall.
do .....	Examining Warehouse.
do .....	Immigration Building.
do .....	Marine Agency.
do .....	Observatory.
do .....	Post Office.
Richmond.....	Public Building.
Rimouski.....	do
St. Henri.....	Post Office.
St. Hyacinthe.....	Public Building.
St. Jérôme.....	do
St. Johns.....	do
St. Régis.....	Custom House.
Sherbrooke.....	Public Building.
Sorel.....	do
Three Rivers.....	Custom House.
do .....	Post Office.
Valleyfield.....	do (rented building).
Victoriaville.....	Public Building.



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## PROVINCE OF ONTARIO.

Almonte.....	Public Building.
Amherstburg.....	do
Arnprior.....	do
Barrie.....	do
Berlin.....	do
Belleville.....	do
Brampton.....	do
Brantford.....	do
Brockville.....	do
do.....	Drill Hall (in progress).
Carleton Place.....	Public Building.
Cayuga.....	Post Office.
Chatham.....	Public Building.
Cobourg.....	do
Cornwall.....	do
Deseronto.....	do (in progress).
Dundas.....	Armouries (in progress)
do.....	Post Office (rented building).
Galt.....	Public Building.
Gananoque.....	Custom House.
do.....	Post Office.
Goderich.....	Public Building.
Guelph.....	do
Hamilton.....	do
do.....	Drill Hall.
do.....	Immigrant Shed.
do.....	Custom House (old).
Ingersoll.....	Public Building.
Kingston.....	Custom House.
do.....	Drill Hall.
do.....	Hospital, Fort Frederick (in progress).
do.....	Immigrant Shed.
do.....	Post Office.
Lindsay.....	Public Building.
London.....	Custom House.
do.....	Immigration Station.
do.....	Post Office.
Napanee.....	Public Building.
Niagara Falls.....	do
Orangeville.....	Post Office.
Orillia.....	Public Building.
Ottawa.....	Central Experimental Farm.
do.....	Drill Hall.
do.....	Eastern Departmental Block.
do.....	Fisheries Museum and Art Gallery.
do.....	Geological Museum.
do.....	Government House.
do.....	Laurevin Block.
do.....	Military Store Building.
do.....	Observatory.
do.....	Parliament Building.
do.....	Printing Bureau.
do.....	Post Office, Customs and Inland Revenue.
do.....	Supreme and Exchequer Courts.
do.....	Western Departmental Block.
Paris.....	Public Building (in progress).
Pembroke.....	do
Petrolia.....	do
Peterborough.....	Custom House.



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Peterborough.....	Post Office.
Picton.....	Public Building (in progress).
Port Arthur.....	do
Port Colborne.....	do
Port Dalhousie.....	Custom House.
Port Hope.....	Public Building.
Prescott.....	Custom House.
do .....	Post Office.
Rat Portage.....	Public Building.
Sarnia.....	Immigrant Building.
Smith's Falls.....	Public Building.
St. Catharines.....	do
St. Thomas.....	Armoury (in progress).
do .....	Public Building.
Sarnia.....	do (in progress).
Strathroy.....	do
Stratford.....	do
Toronto.....	Custom House.
do .....	Drill Hall.
do .....	Examining Warehouse.
do .....	Inland Revenue Building.
do .....	Post Office.
Trenton.....	Public Building.
Walkerton.....	do
Windsor.....	Drill Shed (in progress).
do .....	Public Building.
Woodstock.....	do (in progress).

## PROVINCE OF MANITOBA.

Brandon.....	Experimental Farm.
do .....	Immigration Building.
do .....	Public Building.
Birtle.....	Immigration Station.
Dauphin.....	do
East Selkirk.....	Immigration Shed (old C.P.R. roundh'se).
Fort Osborne.....	Infantry School.
Minnedosa.....	Immigration Shed.
Portage la Prairie.....	Public Building.
Winnipeg.....	Custom House.
do .....	Examining Warehouse.
do .....	Immigration Building.
do .....	Lands Office.
do .....	Post Office.

## NORTH-WEST TERRITORIES.

## ALBERTA.

Calgary.....	Court House.
do .....	Immigrant Shed.
do .....	Public Building.
Edmonton.....	Immigration Shed.
do .....	Registry Office.
Lethbridge.....	Public Building.
Macleod.....	Custom House.
do .....	Court House.
St. Mary's.....	Custom House.
Strathcona.....	Immigration Building.



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ASSINIBOIA EAST.

Indian Head.....	Experimental Farm.
Moosomin.....	Court House.
Qu'Appelle.....	Immigrant Shed.
Wolseley.....	Court House.

ASSINIBOIA WEST.

Medicine Hat.....	Court House.
do .....	Immigration Shed.
Moose Jaw.....	Court House.
Regina.....	do
do .....	Council Chamber.
do .....	Government House.
do .....	do Offices.
do .....	Immigration Shed.
do .....	Jail and Asylum.
do .....	Lands and Registrar's Office.
do .....	Post Office.
do .....	Drill Shed and Riding School.

SASKATCHEWAN.

Battleford.....	Commandant's Residence.
do .....	Government House.
do .....	Immigrant Shed.
do .....	Magistrate's Residence.
do .....	Registrar's do
do .....	Registry Office.
Prince Albert.....	Court House and Jail.
do .....	Immigrant Shed.
do .....	Land and Registry Office.

YUKON TERRITORY.

Clear Creek.....	Mining Office.
Dawson.....	Administration Building.
do .....	Court House.
do .....	Commissioner's Residence.
do .....	Post Office.
White Horse.....	do

BRITISH COLUMBIA.

Agassiz.....	Experimental Farm.
Kamloops.....	Public Building (in progress).
Nanaimo.....	Public Building.
Nelson.....	do (in progress).
New Westminster.....	Drill Hall.



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New Westminster.....	Public Building (in progress).
Rossland.....	do do
Vancouver.....	Immigrant Building.
do .....	Drill Hall (in progress).
do .....	Gun Shed.
do .....	Public Building.
Victoria.....	Artillery Barracks.
do .....	Drill Hall.
do .....	Custom House (old).
do .....	Military Storehouse.
do .....	Post Office (old).
do .....	Powder Magazine.
do .....	Public Building.
William's Head.....	Quarantine Station.







PART IV.

CHIEF ENGINEER'S REPORT

ON

HARBOUR AND RIVER WORKS

INCLUSIVE OF

GRAVING DOCKS AND DREDGING OPERATIONS

ALSO

ROADS, BRIDGES AND SURVEYS THROUGHOUT  
THE DOMINION







## REPORT OF THE CHIEF ENGINEER

DEPARTMENT OF PUBLIC WORKS OF CANADA,  
CHIEF ENGINEER'S OFFICE,  
OTTAWA, Dec. 10, 1901.

FRED GÉLINAS, Secretary,  
Department of Public Works.

SIR,—I have the honour to submit my report on the various works under my charge during the fiscal year ended June 30, 1901.

These works comprise the construction and repair of wharfs, piers, breakwaters, dams, weirs, bank and beach protection works ; the improvement of harbours and rivers by dredging ; the construction, maintenance and operation of government dredging plant ; the construction and maintenance of graving docks ; the construction, maintenance and working of slides and booms, the construction and maintenance of inter-provincial bridges, and approaches thereto, and of bridges on highways, of federal importance in the North-west Territories and the maintenance of military roads ; also hydrographic and ordinary surveys and examinations, inclusive of precision levelling and geodetic measurements which are required for the preparation of plans, reports and estimates, the testing of cements, &c.

I have the honour to be, sir,  
Your obedient servant,

EUGENE D. LAFLEUR,  
*Acting Chief Engineer.*



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During the year surveys, examinations or inspections were made at the following places.

### PRINCE EDWARD ISLAND.

Annandale, King's Co.

Murray River, King's Co.

### NOVA SCOTIA.

Beaver Harbour, Halifax Co.

Canada Creek, King's Co.

Cape Auget, Richmond Co.

Cribbins Point, Antigonish Co.

Delaps Cove, Annapolis Co.

Fox Island, Halifax Co.

Half Island Cove, Guysboro' Co.

Hawk Point Inlet, Shelburne Co.

Kingsport, King's Co.

Lower Cove, Cumberland Co.

Musquodoboit, Halifax Co.

New Harbour, Guysborough Co.

Noel, Hants Co.

Parker's Cove, Annapolis Co.

Point Edward (Sydney), Cape Breton Co.

Port Joli, Queen's Co.

River Hebert, Cumberland Co.

South Gut (St. Ann), Victoria Co.

Washabuck,, Victoria Co.

Yarmouth, Yarmouth Co.

### NEW BRUNSWICK.

Black Harbour, Charlotte Co.

### QUEBEC.

Boucherville, Chambly Co.

Graham, Vaudreuil Co.

Lacolle, St. Johns Co.

Lotbinière, Lotbinière Co.

North River.

Point St. Pierre.

Richelieu River.

Ste. Anne de la Pêrade, Champlain Co.

St. Edouard des Mechins, Rimouski Co.

St. Jean Port Joli, L'Islet Co.

St. Marc, Verchères Co.

### ONTARIO.

Bath.

Black River.

Brookholm.

Grand River (Dunville), Monck Co.

Haileybury, Nipissing Co.

Kettle Point, Lambton Co.

Napanee River.

Oshawa, Ontario Co.

Owen Sound, Grey Co.

Port Arthur and Kamanistiquia River,  
Algoma.

River Thames.

Robbins' Landing, Northumberland Co.

Saugeen River.

Southampton, Bruce Co.

Sydenham River.

Wabigoon, Algoma Dist.

Wendover, Prescott Co.

### BRITISH COLUMBIA.

Kicking Horse River.

Squamish River.

Vancouver.

### YUKON.

Cariboo Crossing.

Five Fingers Rapids.

Head of Lake Labarge.

Hellgate.

Little Rapids.

Rink Rapids.

Six Mile River.

Thirty Mile River.



## NOVA SCOTIA.

## ABBOTT'S HARBOUR.

Abbott's Harbour, some 30 miles from Yarmouth, the county town, is situated on the west side and near the head of the peninsula forming the western side of Pubnico Harbour. It is about  $2\frac{1}{2}$  miles to the south of Argyle sound. The harbour is formed by a small island lying about 100 yards off the main land. The entrance to the harbour from the south is protected by the island and the mainland, and the northern entrance is protected by a shingle beach, which under the action of northerly and north-westerly seas was liable to disappear and leave the harbour without protection. The harbour is the headquarters of a numerous fishing fleet, and considerable quantities of cod, herring, lobsters and other fish are annually caught and exported.

In 1900-1 the sum of \$1,200 was expended in constructing a piece of crib-work beach protection, 235 feet long, 8 feet wide on top, 10 feet wide on bottom and 8 feet high. It is substantially built of round-log crib-work sheathed on the face with 5-inch sawed stuff, floored with 3-inch plank, well fendered and filled solid with stone ballast. It is admirably serving its purpose of protecting the beach from erosion.

Spring tides rise 12 feet, neaps 10 feet.

Total expenditure to June 30, 1901, is \$1,200.

## ADVOCATE.

Advocate Harbour, Cumberland county, is a thrifty and important town situate on Greville bay, thirty miles south-west of Parrsboro, and has a population of from 700 to 1,000. The chief industries are farming, lumbering, mining and fishing.

In 1893 a plan for a new wharf was prepared, but the matter was delayed because a suitable location for the work was a bone of contention. In November, 1898, a public meeting of the residents of the district was held and this question referred to the engineer for settlement. They unanimously agreed to abide by his decision. As a result the wharf was located, starting from that part of the bridge where the channel ran under. During the fiscal year 1898-9 the construction of the wharf was begun by the department and was finished the following year; it has a total length of 360 feet, 20 feet wide on top, except the last 40 feet, which is 30 feet wide, and a height of from 12 to 16 feet. It is constructed of pile trestle bents 10 feet apart thoroughly braced, bolted and waled. The entire outside length, together with the outside end of the work, was close-piled for the purpose of affording shelter for vessels lying on the inside of the wharf. During the heavy winter storms of last year this was found unsuitable, as in fact nearly all close piling in works has proved to be. In the spring of 1901 the wharf was sheathed for the whole length of 360 feet on the outer side and along the head which is 30 feet wide. The sheathing used was three inches in thickness of sawn plank and spruce which was well put on, running from the bottom of the wharf to the top, and was thoroughly fastened. The cost of this sheathing was \$431.82.

Total expenditure to June 30, 1901, is \$3,206.59.

## ARGYLE SOUND.

Some 30 miles south-east of Yarmouth, the county town, Argyle is situated on the west side of the head of the peninsula forming the western side of Pubnico Harbour.



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In 1900-01, the sum of \$500 was expended in constructing a small wharf on the site of an old one. The new work consists of a block of substantially built crib-work 28 feet long, 11 feet wide, and 6 feet high, well fendered, floored and ballasted. An approach was also built of granite boulders covered with gravel, 70 feet long, 25 feet to 28 feet wide and from 3 to 8 feet high.

Spring tides rise 12 feet, neaps 10 feet.

Total expenditure to June 30, 1901, is \$500.

## ARISAIG.

Arisaig, Antigonish county, is on the southern shore of the Northumberland strait, 15 miles to the eastward of Merigomish, the nearest harbour.

The works at this place consist of a pier, built by the provincial government, prior to confederation, which came under the charge of the federal government in 1870; and a breakwater constructed in 1886-8.

The breakwater is 300 feet in length and 20 feet in width on top, with an L at the outer end 40 feet in length. The depth of water at its outer end, at low water springs, is 5 feet.

The pier originally consisted of an approach 245 feet in length, and an outer portion 174 feet long, varying from 40 to 44 feet in width. Repairs and improvements were made from time to time, including the construction, during 1889-91, of an extension 100 feet in length. In 1896-7-8, the outer end of the seaward face of the pier was strengthened and a block 24 x 24 feet on top was placed on the seaward side of the outer end, to strengthen the face work, and to secure and retain a proposed extension of the stone talus in which some 250 cubic yards of large stone were placed.

During the fiscal year 1898-9 the stone talus on the seaward side of the pier was completed by placing 482 cubic yards of large stone, and in renewing 58 superficial feet of 5-inch plank and three fenders.

During the severe north-west gale of September 12, 1900, both the pier and the breakwater suffered slight damage, and the sum of \$292.19 was expended on repairs and renewals, as follows:—In reconstructing 75 feet of the roadway, which had been carried away to a depth of from 1 to 3 feet, in replacing and renewing 40 pieces of plank covering, 100 lineal feet of centre curbing over the covering, 75 lineal feet of cap timbers and 35 pieces of sheathing, and in placing 50 cubic yards of large stone on the talus, on the seaward side, near the outer end of the pier.

The repairs to the breakwater consisted in replacing and renewing a few pieces of plank covering at the outer end.

The depth of water at the outer end of the pier, at low water springs, is 10 feet. Spring tides rise 5 feet.

Total expenditure to June 30, 1901, including refund of \$541.41 to provincial government, is \$35,029.07.

## AVONPORT.

Avonport, King's county, is a small farming village with a population of about 250, situated at the mouth of the Avon river (at this point nearly two miles wide) and on the Dominion and Atlantic Railway, 12 miles north-west from Windsor, the county town of Hants, and 13 miles east from Kentville, the county town of King's. Some two or three millions of bricks are made here during the year.

A small wharf of ordinary round-log, stone-filled crib-work was built before confederation by the inhabitants aided by the provincial government. It is 300 feet long, 22 to 25 feet wide on top, and 17 feet high at the outer end, which is dry at L.W. O.S.T. In 1886, the department, having assumed control of the wharf, some little time previously, spent \$1,200 in extensive general repairs. During the year 1896-7 the sum



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of \$500 was expended in rebuilding the top of the shoreward half of the work, the covering, floor stringers, and upper two or three logs in height were renewed.

In 1900-1 the sum of \$998.90 was expended in extensive renewals. The work done consists of the taking down and rebuilding of the outer 65 feet in length of the work a height of 6 feet, the next 45 feet shorewards was rebuilt 3 feet in height. Of the next 30 feet the whole of the flooring was renewed, including planking, guards and stringers; a number of new fenders, and six new mooring posts were also put in place.

Spring tides rise 48 feet, neaps 40 feet.

Total expenditure to June 30, 1901, is \$4,198.65, including the sum of \$816 paid as a refund to the provincial government in 1887-8.

This work was transferred to control of the Marine and Fisheries Department on June 12, 1888.

## BARRINGTON HEAD.

The situation of this place is described under Barrington Passage. For many years the people of this community have been compelled to either boat or team all their coal, flour and other necessities at a large extra expense.

During the last fiscal year the sum of \$1,832.22 has been expended in constructing a wharf where loaded schooners would be able to discharge cargo. This wharf is constructed upon the site of the old wharf and consists of two parts, the approach and the main wharf. The approach is a stone bank 100 feet in length, 20 feet in width on top, and has a height of 10 feet at the outer end. The main wharf is built of four stone-filled open-face, log cribs, each 20 feet in length and separated from each other by three spans each 15 feet in length. It has a height at the outer end of 17 feet and a width on top of 25 feet. It is thoroughly fendered and ballasted to the under side of the floor stringers. It is a well-constructed wharf and would compare favourably with any work of a like nature in Canada.

## BARRINGTON PASSAGE.

Barrington, Shelburne county, is distant 45 miles south-east of Yarmouth, and 30 miles south-west of Shelburne, and is within 10 miles of Cape Sable, the most southerly point in Nova Scotia. The settlement is a straggling one, covering a distance of about three miles. Its upper part, known as the 'Head,' is situate at the extreme head of Barrington bay, and has a population of about 1,000. The lower part is known as 'the Passage,' situate on the passage between the mainland and Cape Sable island; it has a population of about 700. It is a port of call for the line of steamers plying between Halifax and Yarmouth, and there is a steam ferry running across the passage, about three-quarters of a mile, to Cape Sable island.

In 1888-9 the department began the construction of a wharf, completing it in 1890 at a cost of \$7,411. It extends over mud flats, bare at low water, to Sherrow's channel, so-called, and is 944 feet long, 20 feet wide, and has 12 feet of water at its outer end at L.W.O.S.T. The seaward end for 138 feet is built of round-logs, stone-filled, crib-work; all the remaining portion of the work being of pile bents. There is a gradual rise in the floor from the shore to the end of three feet six inches where the floor is six feet above H.W.O.S.T. At the outer end there is an 'L' 32 feet wide and 72 feet long on the channel, on which is a freight-shed 35 by 20 feet, and a drop landing. In 1892-3 the sum of \$600 was expended in constructing a triangular piece of pile wharfing to fill up the angle between the 'L' and the main portion of the work for the purpose of affording more accommodation for the handling of goods and the movement of trucks and teams. In 1898-9 the sum of \$400 was expended in strengthening the outer end of this work and in placing some covering. In 1899-1900 the top work of the entire wharf showed such evidence of being in unsafe and dangerous condition that the sum of



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\$1,162.02 was expended in effecting necessary repairs. At the time it was supposed that many of the old stringers could be again utilized but when the wharf was stripped it was discovered they were unfit for use, the ends being entirely rotted away, and new timber had to be procured. The work, however, was thoroughly performed. Over 80,000 feet of planking, stringers, &c., was purchased for this work; all the old iron in the work was again utilized and every principle of economy was practiced in order to make as good repair as possible.

During the last fiscal year the further sum of \$249.26 was expended on this work. The wharf is now in excellent shape. The entire covering is new, including the stringers and guard-rails. The corners upon which the greatest strain comes were strengthened by means of additional piles and heavy iron straps, and twenty new fenders have been placed along the sides.

Total expenditure to June 30, 1901, \$20,150.42.

This work was transferred to control of Department of Marine and Fisheries, August 5, 1891.

#### BEAR COVE.

Bear Cove Point, Shelburne county, is situate about six miles west of Barrington, four miles north of Clarks Harbour, and has a population of about 400. The nearest wharf is about five miles distant, and as the people are chiefly fishermen, they necessarily require landing facilities for their boats and goods.

During the fiscal year the sum of \$1,845.60 was expended in constructing a new wharf, which, when completed, will consist of an approach 57 feet long, 24 feet wide on top, and 9 feet high at the outer end, with a piece of solid, open-faced, stone-filled, log cribwork, 100 feet in length, 19 feet wide, and 19 feet high at the outer end. This work was originally intended to have an 'L' of 30 feet by 10 feet, but after the work progressed, it was foreseen that this could not be finished, and the plan was abandoned. By the abandonment of the 'L' there remained about \$120 worth of material, which was placed in the work at Clarks Harbour, and this amount will be able to complete the work.

#### BEAVER RIVER.

Beaver River is a prosperous fishing and farming village of some 400 people, situated on the coast of St. Mary's Bay, 13 miles north of Yarmouth, and on the county line between Digby and Yarmouth. The little stream of the same name which issues here, discharges through a gravel beach, which formerly, when the stream was low, obstructed its mouth and ultimately closed it altogether, so that the water had to find exit by soakage through the gravel.

In the year 1886-7, operations were begun by the department to improve the river mouth and to remedy this defect. A passage was cut through the gravel bank and sea-wall, and a short breakwater was built at the south side of the mouth to catch the gravel and prevent the bank reforming; besides protecting the river mouth, forms a good, though short, landing pier for vessels during the summer months. This work proving satisfactory, the sum of \$1,500 was expended by the department in 1888-9 in further improvement. This consisted of extending the breakwater 100 feet, sheet-piling the northern face of the same, which was exposed to the action of the river and in danger of being undermined, and in extending the short pier on the northern side of the mouth, it being found that storms from the north, at times, threw in a considerable quantity of gravel and made it difficult for fishing boats to enter.

In 1891-2, the rush of water during the freshets having begun to undermine the work, the sum of \$450 was expended in close-piling a portion of the river face, and in levelling up and repairing the top, which was leaning over into the stream. In 1899-



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1900, the sum of \$732.35 was expended in rebuilding the whole top of the work, for a height of from 3 to 5 feet, new fenders being also placed around the whole block.

In 1900-1, an expenditure of \$1,080.04 was made in extending the breakwater by the addition of a new block, 30 feet long, 25 feet wide, and of an average height of 19 feet. The older portion of the work was also repaired, new caps, fenders and a small quantity of flooring being placed in position.

Total expenditure to June 30, 1901, is \$3,762.30.

## BIG BRAS D'OR.

Big Bras d'Or, Victoria county, is on the south side of the channel of the same name, near the entrance into the Atlantic ocean.

With a view of enabling the residents of this locality to avail themselves of the advantages to be derived from the steamers which ply between Sydney and ports on the Bras d'Or lakes, a public wharf was built in Livingstone's cove, situated on the northern side of Boularderie Island, four miles from its head, and opposite Kelly's cove on the north side of the Big Bras d'Or channel, here a mile in width.

The wharf was completed in 1888-9. It is a block and span structure 150 feet in length and 20 feet in width, with an L at the outer end, 40 feet long and 20 feet wide, giving a length of 60 feet along the channel face, constructed entirely of native timber. The depth at low water at the outer end is 11 feet.

As it was found that the close-piling around the outer block had been completely destroyed by the teredo, below the line of low water, and that the covering was worn out and decayed, and that portions of the cap required renewal, during 1900-1, the sum of \$597.71 was expended in close-piling the outer face of the outer block, in placing double walings on the ends of block, and in renewing the covering and the cap-timbers on the outer block and on 6 feet of the approach.

Spring tides rise 2 feet.

The total amount expended on this work to June 30, 1901, is \$3,918.12.

## BLACK POINT.

Black Point, Shelburne county, is situate about 17 miles south-west of Shelburne, and 15 miles east of Barrington. It has a population of about 500, whose chief pursuits are fishing and farming. Its inhabitants have had no adequate facilities for landing freight, and in the past have been compelled to boat their coal, flour and other necessities for a distance of from five to ten miles.

In the last fiscal year a wharf, to afford landing facilities, was constructed at a cost of \$1,826.40. It consists of first, an approach constructed in the form of a rock bank 47 feet long and 24 feet wide on top, and 8 feet high at the outer end; secondly, two blocks of stone-filled open-faced log crib-work each 20 feet in length and separated by a span 13 feet in length; thirdly, 120 feet in length of pile trestle work. The main wharf is 22 feet in width, with the exception of the outer 20 feet which is 42 feet in width over all, and has a depth of about 11 feet at its outer end at L.W.O.S.T. The pile work consists of pile trestle bents, separated 10 feet centre to centre of the piles, and is thoroughly braced, waled and fendered. It is of good substantial workmanship, and although rough in appearance will suit all the purposes for which it is designed.

## BLUE ROCK.

Blue Rock, Antigonish county, is situated on the southern coast of St. George's Bay, about 2½ miles to the eastward of the entrance into Tracadie harbour, and 6 miles to the westward of the northern entrance into the Gut of Canso.



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A breakwater, extending 316 feet in a south-westerly direction from Blue Cape, for the protection of a boat landing and to make a shelter for fishing boats, was commenced by the department in 1886, and completed in 1889. It is from 16½ to 17 feet wide on top, with a sloping face on the seaward side, sloping 1 to 1, from the top of the work to 1 foot below high water. It was strongly constructed with faces of squared native timber and fully ballasted. The depth at the outer end, at low water springs, was 12 feet, and over the area sheltered from the north and east, from 11 to 5 feet, the height at the outer end is 19 feet.

The face-timbers below the line of low water, having become weakened, and in places destroyed by the tereclo, and the ballast in the work having settled during 1892-3-4, the work was reballasted where necessary, the outer end and the seaward face, and for a distance of 15 feet on the inside face, the work was close-fendered and stone protection was placed along the seaward face, the outer end and on 40 feet of the inside face, sloping 1½ to 1 from 1 foot below high water mark on the seaward face and outer end, and 1 to 1 from high water mark on the inside face.

During 1900-1 the sum of \$1,971.81 was expended in further repairs to the sloping face, in reballasting, renewing floor-stringers, covering and cap, where necessary, and in raising the stone talus on the seaward side and end, and in extending it on the inside to a distance of 175 feet from the outer end. The talus has been raised up to the level of high water at the faces, sloping 2½ to 1 on the seaward side and end, and 1½ to 1 on the inside face. The amount of stone placed is about 1,200 cubic yards.

Spring tides rise 4 feet.

Total expenditure to June 30, 1901, is \$12,036.30.

#### BOULARDERIE CENTRE.

Boularderie Centre, Victoria county, is on the southern side of the Great Bras d'Or channel, about 8 miles to the westward of its entrance into the Atlantic, and 10 miles to the eastward of its entrance into the Little Bras d'Or lake.

A contract was entered into on April 25, 1901, for the construction of a wharf. The work under contract being 164 feet in length and 20 feet in width, and consisting of an approach of stone, clay and gravel, 10 feet long, of a crib-work abutment 30 feet in length, of two crib-work blocks 20 x 20 feet, and of an outer block 24 x 40 feet, with 20-foot openings between the blocks, spanned and covered over. The abutment and the blocks are to be constructed of round timber laid open-faced, cross-tied up to high water and protected all around with fenders, and the faces of the outer block and of the block next to it with close-sheathing.

The depth at extreme low water along the channel face will be 13 feet. Spring tides rise 2 feet.

Up to the end of the present fiscal year the work had not been completed.

Expenditure during fiscal year, \$165.94.

#### BROAD COVE.

Broad Cove is a small and thrifty farming and fishing village of about 350 people, situated on the Atlantic coast, at the southern corner of Lunenburg county, and distant about 20 miles by public road from Bridgewater.

The breakwater, which affords the only shelter to about 20 fishing boats, was built in 1876, by day labour, at a cost of \$4,000, of which \$3,000 was contributed by the federal and \$1,000 by the provincial government. It is a well-built structure of close-faced, stone-filled crib-work, 250 feet long, 22 feet wide and 12 feet high at the outer end, which is about 4 feet above H.W.O.S.T.

In 1894-5 the department expended the sum of \$499.99 in thorough repairs. The outer end of the work was raised about 14 inches, new flooring, stringers and planking



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were placed on the outer 100 feet in length, and the work was newly sheathed vertically. A number of new fenders and a quantity of ballast was put along the seaward side, and a number of heavy boulders were placed to break the force of the waves.

In 1900-1 an expenditure of \$499.93 was made in repairs, consisting of the renewal of 160 feet in length of the top of the shoreward end of the work, including new plank-ing, floor stringers, 300 feet in length of guard timber, 16 new fenders, 60 feet long of 3-inch sheathing on the outer face, a new permanent derrick and about 150 yards of large boulders were placed along the seaward face of the work.

Spring tides rise 7 feet, neaps  $5\frac{1}{2}$  feet.

Total expenditure to June 30, 1901, is \$3,999.92.

## BURYING ISLAND (CANSO).

Canso Harbour, Guysboro' county, lies at the southern entrance of Chedabucto bay, through which all vessels entering or leaving the Gulf of St. Lawrence by the Gut of Canso must pass, and near the point where the general trend of the coast of Nova Scotia changes from south to west.

It has two entrances, the northern, leading from Chedabucto Bay, and the southern from the Atlantic. Many vessels pass through the harbour in order to avoid going around the dangerous rocks and ledges which lie outside of it. It is also much frequented by Canadian and American fishing vessels, which run in for shelter or to await a change of wind.

The harbour is formed by Piscatiqui, George and Grassy islands on the east, and by Durrell island and the mainland on the west; Cutler island and the shoals between it and Durrell island protect it from the north, and Burying island and the bar uniting it with Lanigan point, from the south-east.

The clay banks of Burying island have been gradually wasting away until only a small portion of the island remains above high water. Its destruction would have transformed it into a dangerous reef and left the harbour exposed to the swell from the Atlantic. It became necessary, therefore, to protect the remains of the island by a breakwater. This work was begun in 1880 and finished in 1882. It is 290 feet long and 21 feet wide, constructed of strongly-framed crib-work, fully ballasted and covered with large stone, with sloping spurs at the ends on the seaward side, 18 feet in length and 16 feet in width, covered with 3-inch plank.

The work stood remarkably well, as up to the end of the fiscal year 1899-1900, no expenditure had been made on it, since its completion.

During the year 1900-1 the sum of \$34.60 was expended in replacing 796 feet B.M. of the covering of the spurs and in placing 6 x 3-inch pieces of timber over the ends of the covering.

Spring tides rise  $6\frac{1}{2}$  feet, and neaps  $4\frac{1}{2}$  feet.

The total expenditure on this work is \$9,034.60.

## CANADA CREEK.

Canada Creek, also called Black Rock, King's county, is a small fishing and farming village of about 150 people, on the south shore of the Bay of Fundy, 60 miles east of Digby Gut, and 8 miles west of Hall's Harbour.

The harbour is formed by two piers or breakwaters built one on either side of the mouth of a small stream. That on the east side, which is entirely detached from the shore, serves merely as a breakwater, and was built by the department in 1878-9, at a cost of \$3,000. It is 150 feet long, 25 feet wide on top, and from 12 to 15 feet high, substantially built of round-log crib-work, close-faced, well ballasted and fendered. The breakwater on the western side, originally 248 feet long, which serves both as a breakwater and a landing pier, was built before confederation at the joint expense of



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the inhabitants and the provincial government. It is built of round-log crib-work, the seaward face being protected by a close sheathing of flatted spars. In 1874, it was extensively repaired at a cost of \$2,500. In 1884, further repairs were made, and a new block 57 feet long by 10 wide, was built on the seaward side of the shore end. In the winter of 1889-90 the outer 100 feet in length was completely wrecked, and other minor damage caused by severe gales. The shortening of the structure caused the gravel to wash around its end, and fill up the berth for vessels in the bed of the stream along its eastern side. In 1892-3 the department built a new block of crib-work on the outer end of the old work, 50 feet long, 14 feet wide on top, and from 8 to 11 feet high between the outer end of the existing work and the remains of the old. This block was totally destroyed in November, 1899.

In 1900-1 an expenditure of \$1,928.09 was made in repairing the work, and in extending it by building a new block 34 feet long, 30 feet wide, and at the outer end 28 feet in extreme height. At the close of the fiscal year this new block was not quite complete, lacking floor, fenders and break.

Spring tides rise here about thirty-eight feet.

Total expenditure to June 30, 1901, is \$11,813.88, including a refund of \$550 to the provincial government.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

#### CAPE NEGRO.

Cape Negro island, Shelburne county, is situated at the entrance of Negro harbour, and is about midway between Shelburne Harbour and Cape Sable. The island, which is higher than the adjacent mainland, and distant about one mile, is two miles and a half in extreme length from north-west to south-east. It is divided into two sections of nearly equal size by a narrow neck or spit of shingle and gravel which is dry at all times of tide, and which is protected from destruction by beach protection. Communication with the mainland is maintained by small boats, the landing place on the island being on the extreme northern point of its north-eastern half. As this landing place is on a straight open beach, fully exposed to gales, from the east and south-east, it was protected many years ago by the construction of a block of crib-work, reaching from high to low water mark in order that boats might be able to land during heavy weather. In 1892 this work being much decayed and out of repair, it was rebuilt by the department. The new work, which was built directly on the site of the old, was 80 feet long, 6 feet wide on top, and about 8 feet high battering front and back. It was built of round-log crib-work and filled and backed with stone ballast. On the leeward side are provided skids of round spars, forming a sort of launchway, 16 feet wide. This work is built altogether too low to protect this launchway or landing and in the last fiscal year the sum of \$271.69 was expended in repairing the old work and in raising its height from one to five feet. Next year this work will be extended a further length of 45 feet, and when this latter work is completed the landing will be adequately protected.

Total expenditure to June 30, 1901, \$975.05.

#### CAPE COVE.

Cape Cove, or Cape St. Mary, Digby county, is situated on the east coast of the mouth of the Bay of Fundy, near the entrance of St. Marys Bay. It is 19 miles north of Yarmouth and 27 south of Weymouth. It has a population of about 150 people, engaged chiefly in fishing; it is one of the best fishing stations on the coast of St. Mary's Bay, cod, haddock, and herring being caught in abundance.

A breakwater for the protection of the fishing fleet was begun about the year 1840 and built, in sections, by the inhabitants, aided from time to time by small grants,



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amounting in all to about \$1,200, from the provincial government. In 1881-3 the department expended \$4,499.47 in making extensive repairs and renewals, part of the work under these appropriations being the construction of a buttress built of round-log crib-work 50 feet long and 15 feet wide to support the middle of the southern face of the work where a breach had been made by eating away of the face-logs by the lim-noria, and the action of the heavy seas. The work is 300 feet long, 25 feet wide on top, and 24 feet high at the outer end.

In 1900-1 the sum of \$750.99 was expended in rebuilding a gap in the middle of the work made by the storm of March 1, 1900.

Spring tides rise about 18 feet.

Total expenditure to June 30, 1901, is \$7,618.86, including a refund of \$1,304.38 to the provincial government in 1887-8.

## CARIBOU ISLAND.

Caribou Island, Pictou county, is on the Northumberland strait, 5 miles to the westward of the entrance to Pictou harbour.

Caribou harbour, sheltered by Caribou island and a smaller island lying to the eastward of it, is an extensive place 6 miles in length and one mile in width, but the water is shallow.

The principal entrance between the two islands has only a depth of 4 feet at extreme low water, and the flats between the mainland and the western extremity of Caribou island are dry at extreme low water, except in a few small channels.

A causeway of brush and stone 1,330 feet in length and 18 feet wide on top, between the mainland and the western extremity of the island, commenced in 1890-1, was, after the completion of the work undertaken in 1894-5, up to the level of ordinary high water over 560 feet of its length, and about  $1\frac{1}{2}$  feet below that level over the remaining 770 feet. In 1897 a breach was made through the work near its western extremity, where the bottom was scoured to a depth of about 4 feet at low water, and the top of the low portion, 560 to 1,300 feet from the west end, was disturbed in places particularly at a point 600 to 670 feet from the west end where it was carried away to within  $1\frac{1}{2}$  feet of low water.

Spring tides rise 6 feet, neaps 4 feet.

During the last fiscal year the sum of \$1,305.60 was expended in filling in the breaches in the brush and stone work, and in raising the work to about the level of ordinary high water.

The total expenditure to June 30, 1901, is \$2,886.20.

## CHEBOGUE HARBOUR.

Chebogue Harbour, Yarmouth county, is situated about 7 miles south of the town of Yarmouth. Near its mouth, and surrounded by Fox island, Beal island, Perry island, Jacko island, and Shortliff point, is a small but well sheltered anchorage or roadstead that offers shelter to a considerable number of fishing boats and other small craft engaged in fishing and general trade. The anchorage is partly protected from the south by Fox island, but its western portion, which is mainly dry at low water and much used at or near high water by boats plying between Chebogue point and other ports, and by other craft, is guarded by a gravel bar or beach. The beach is some 800 feet long, about 20 feet wide from high water to high water, and 4 to 5 feet high above H.W.O.S. T. This beach, being of loose water-worn gravel, was gradually wearing away and moving northwards under the action of southerly seas. To preserve the beach, and the anchorage north of it, the department in 1900-1 expended the sum of \$1,798.34, in building 360 feet in length of beach protection work. The crib-work is  $8\frac{1}{2}$  feet high, 8 feet wide on top, plumb on the beach or shoreward face, battering 1 in 4 on the back or harbour side, and substantially built of round logs, well bolted, fendered and filled with ballast.

Total expenditure to June 30, 1901, is \$2,655.03.



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## CHEGOGGIN.

Chegoggin, Yarmouth county, is a small fishing and farming village, with a population of a couple of hundred people, situated on the Bay of Fundy coast, about 5 miles north of Yarmouth. The little bay of the same name is one-third of a mile north and south, and about the same width east and west, fully exposed to the south-west, but sheltered from every other quarter ; it is dry at low water, but at high tide has a depth of from 12 to 14 feet.

Over half a century ago, a breakwater was built by the proprietors of the marsh in a position immediately to the west of the present work ; it was totally destroyed about twenty years ago, not a vestige of it being visible to-day.

In the winter of 1895-6 the inhabitants, aided by a grant of \$45 from the municipal council, built a small breakwater, 80 feet long,  $12\frac{1}{2}$  feet wide and from 6 to 11 feet high, on the south side of the stream's outlet. In 1899-1900 the sum of \$598.12 was expended in lengthening the breakwater by the addition of a new block 60 feet long, 15 feet wide and from 10 to 13 feet high. It is cheaply but substantially built of round-log crib-work of the usual type.

In 1900-1 the breakwater was further extended a length of 51 feet at a cost of \$692.21. The new block is 11 feet wide on top, with side batters of 1 in 12, and from 12 to 13 feet high. In addition to the extension, a piece of the shoreward end of the work was rebuilt, 30 feet long, 8 feet wide and from 7 to 9 feet high, at a cost of \$88.03.

Spring tides rise 16 feet, neaps 13.

Total expenditure to June 30, 1901, is \$1,378.36.

## CHESTER.

Chester, Lunenburg county, is a village of about 1,000 people engaged in fishing, farming and general trade, situated at the head of Mahone bay, 45 miles south-west from Halifax. During the summer season a steamer, plying between Halifax and Lunenburg, makes weekly calls. It is a place of some importance, owing to its fine situation and beautiful scenery. It is well known and frequented as a summer resort.

In 1864-5 the provincial government, at a cost of about \$3,000, dug a boat passage or canal through the isthmus joining the mainland and Peninsula point, about half a mile south of the village, to enable the inhabitants of the western shore of Chester basin to more easily reach Chester harbour. The passage is about 200 feet long, 14 feet wide and from 2 to 8 feet deep. In 1885-6, the passage having filled in considerably, the department expended the sum of \$246.76 in reopening it and protecting the sides with rough stone walling. In 1886-7 the sum of \$449.71 was expended in again opening the passage and in repairing the walls on either side.

In 1900-1 the sum of \$250 was expended in again removing the accumulated sand and gravel, and in repairing and extending the side walling.

Spring tides rise 6 feet, neaps 5 feet.

Total expenditure to June 30, 1901, is \$986.47.

## CHIPMAN BROOK.

The harbour at Chipman Brook, King's county, is formed by the mouth of a small stream which issues on the south shore of the Bay of Fundy, half way between Hall's Harbour and Canada Creek, or about three miles from each place.

About the year 1857 a public wharf, 175 feet long and 25 feet wide, was built at the joint expense of the inhabitants and the provincial government. Since the Public Works Department has had charge and control of this work, numerous expenditures have been made in repairs and renewals.

In 1899-1900 the sum of \$1,000, and in 1900-1 a further sum of \$1,485.47, was expended in extensive renewals and repairs. The work done under these two expendi-



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tures consists of the reflooring of the whole work, the fendering and close-sheathing of the seaward face and outer end, and the construction of a break on the seaward side; also, the building of a triangular-shaped piece of work to fill the gap on the inner or eastern side, 104 feet long, 15 feet wide on one end, tapering to nothing on the other, and from 11 to 14 feet high. This new piece has been solidly constructed of round-log crib-work, well fendered and filled solid with stone ballast.

Spring tides rise about 38 feet.

Total expenditure to June 30, 1901, is \$10,152.80.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

## CHURCH POINT.

Church Point, Digby county, is situated on the south-east side of St. Mary's Bay, 9 miles south-west from Weymouth. It has a population of 200 people engaged in farming and fishing.

The works, which consist of a wharf, a retaining wall, and a breakwater, appear to have been built between the years 1856 and 1866, at the joint expense of the provincial government and the inhabitants, the expenditure of the government having been \$1,055.66. In 1875-6, the department expended the sum of \$2,000, the inhabitants contributing an equal amount, in repairing the northern face and in building an ell 72 feet long by 20 feet wide at right angles to it, with the object of preventing the gravel from working around the outer end. The movement of gravel, which is from south to north, has always been more or less of a difficulty and a detriment to the port. In 1890-1, the gravel having worked around the outer end of the breakwater and formed a bar across the entrance to the loading berth, a small groyne, 40 feet long and 24 feet wide, was built, projecting at right angles from the outer or north-west corner of the breakwater. This groyne was extended in 1894-5 a further distance of 30 feet, and in 1896-7 it was again extended by a length of 120 feet and width of 16 to 25 feet, by a height of 10 to 22 feet, all of round-log crib-work. The sluice gates at the head of the dock, where the fresh water stream makes exit, were rebuilt in order to command the stream to scour away the gravel from alongside the wharf front.

In 1900-1, the sum of \$116.69 was expended in rebuilding 63 feet in length of the wharf front, 16 feet high and from 10 to 20 feet wide, 35 feet of this length being close-piled. The sluiceway was entirely rebuilt, fitted with double lifting gates instead of single. The floor of the sluice was lowered 3 feet and an apron extending 13 feet up stream and 50 feet down stream, was constructed of 3-inch plank, well spiked to heavy stringers, bedded in closely packed stone and close-piled at both ends to prevent scour.

Spring tides rise about 22 feet.

Total expenditure to June 30, 1901, is \$10,557.81, including a refund of \$1,692 to the provincial government in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

## CLARK'S HARBOUR.

Clark's Harbour, Shelburne county, is a prosperous and important fishing village of twelve to fifteen hundred people, situate on the south-west side of Cape Sable island. It is the only village of any size and importance on the island and occupies the position of the second best fishing town in Nova Scotia, the total value of the fishing industry in 1900 being somewhere in the vicinity of \$450,000. During the summer, the steamers plying between Yarmouth and intermediate points along the coast, call; whilst there are owned in the place a fleet of from 15 to 20 schooners ranging from 8 to 115 tons, with a supplementary fleet of over 200 smaller vessels, ranging from 2 to 20 tons. The depth of water at low tide at the head of the wharf is from seven to nine feet.



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During the fiscal year 1899-1900 the department commenced the construction of a breakwater, the whole length of which was to be 680 feet with a width on top of 16 feet, and a height of 9 feet at its outer end.

During the last fiscal year the sum of \$3,711.63 was expended and the sum of \$5,400 is now being expended in completing the work. At the end of the fiscal year the work was completed for a length of 410 feet. It is 16 feet wide on top, and has a depth at the outer end of  $17\frac{1}{2}$  feet. The portion of the work completed is built entirely of rough, hand-laid stone and has a slope on the outer side of one vertical to two horizontal and on the inner side of one to one.

Total expenditure to June 30, 1901, is \$6,788.27.

#### CLEMENTSPORT.

Clementsport, Annapolis county, is a village of about 1,000 people, situated near the mouth of the Moose river which enters the Annapolis basin 8 miles south-west of Annapolis, and 12 miles north-east of Digby.

In 1900-1 the department expended the sum of \$500.05 in widening, straightening and deepening by hand digging the vessel channel in the tidal mouth of the river. The excavation extends for a distance of about 300 feet above, and the same distance below, the railway bridge, the material removed consisting of gravel and mud. The additional width given to the channel is from 10 to 25 feet, the additional depth being from 1 to 3 feet; the channel was also straightened by cutting off several projecting points.

#### COMEAU'S HILL.

Comeau's Hill, Yarmouth county, is the name of a straggling settlement of some two or three hundred people, situated on the west side and close to the extremity of the peninsula between Chebogue harbour and Goose Bay, about 15 miles south south-west from Yarmouth, the county town. It is conveniently situated as regards the fishing industry of a considerable district, and is the headquarters of a fleet of some 30 or 40 boats.

In 1900-1 the department expended the sum of \$1,000 in building a breakwater 135 feet long, 16 to 20 feet wide on top, and 12 feet high at the outer end. The whole work is constructed of granite boulders, the inner or harbour face being of split boulders laid with a smooth battered face of about 1 in 12, the outer or seaward face of round and irregular shaped rocks with a slope of  $1\frac{1}{2}$  or 2 to 1. The work, so far as it goes, answers its purpose admirably, and is a permanent and satisfactory job.

Spring tides rise 12 feet, neaps 10 feet.

Total expenditure to June 30, 1901, is \$1,000.

#### COMEAUVILLE.

Comeauville is a straggling settlement of some 200 or 300 people engaged in fishing and farming, situated on the eastern shore of the Bay of Fundy, 35 miles south-west from Digby, the county town.

The wharf, which was built many years before confederation, was partially or wholly destroyed about 1878, and thereafter abandoned by the department. During the next 10 or 15 years it was partially repaired by private parties. It appears that at the time that it was destroyed the inhabitants petitioned for a grant of \$4,000 to \$5,000 for the purpose of restoring the work and the money was voted. Before work was begun, however, Mr. Campbell, then federal member for the county, died, and the money was diverted to repairing the breakwater at Little Brook, which the inhabitants



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seem to have called 'Comeauville' or 'Comeau's,' for the purpose of deceiving the department, and securing the appropriation. The departmental reports show expenditures at 'Comeauville' of \$3,135.56 in 1887-8, and of \$4 in 1888-9, but it is probable that these amounts were actually expended at Little Brook. Comeauville is a mile and a quarter north from Saulnierville, and  $1\frac{3}{4}$  south of Little Brook.

In 1900-1 the sum of \$4,346.02 was expended in extensive renewals, repairs and improvements. A gap of 75 feet in length between the shore end and the outer block was rebuilt in solid crib-work to replace the old delapidated work destroyed by the storm of March 1, 1900. This new block is from 20 to 24 feet in width, from 4 to 18 feet in height, thoroughly well and substantially built of round-log crib-work, filled solid with ballast and sheathed on the seaward side with 6-inch sawed spruce. On the seaward side also a break has been erected 4 feet high. An extension to the breakwater was built, 37 feet long, 28 feet wide and from 20 to 22 feet high; this new block is strongly built of round-log crib-work of the usual type, close-sheathed on the seaward face and the outer end, well fendered and filled solid with ballast. In addition to this the top of the old work for 57 feet shorewards was rebuilt a height of 5 to 8 feet. The bottom of this portion was sound enough to carry a new top while the upper part was much decayed and practically a wreck.

Work was also commenced on the extension shorewards of the breakwater to replace the very old work destroyed some 20 or more years ago.

Total expenditure to June 30, 1901, is \$7,485.58.

## COW BAY (PORT MORIEN).

Cow Bay, Cape Breton county, is on the eastern coast of Cape Breton island, about 18 miles to the eastward of the entrance to Sydney harbour.

A breakwater, built by the owners of the Gowrie mines, on the north side of the bay, came under charge of the department in 1873. It was originally 1,386 feet in length and about 44 feet in width, and had a depth at the outer end, at low water, of 17 feet.

The breakwater was seriously damaged during the great gale of August 24, 1873, and was subsequently reconstructed. Extensive repairs and improvements were made nearly every year up to 1895, when it consisted of 220 feet of old work, protected on the seaward side by a beach of shingle and boulders; 360 feet of old work 44 feet in width, with a new inner face work, and a break on the seaward side built over the remains of the old work; and 806 feet of inner work and of counterforts and connecting outer face works, placed about 22 feet apart and connected by tie-walls with the spaces filled with earth and stone ballast. The work from 1,128 feet, from the inner end to the outer end, was badly damaged in February, 1895, and was subsequently destroyed.

During the years 1897-8 and 1898-9 the sum of \$14,988.40 was expended in repairing and strengthening the outer face works from 1,128 feet from the inner end, inwards; and in 1899-1900 \$3,409.10 was expended in nearly completing the renewal of the stringers and covering of 534 feet of the inner face work (581 to 1,115 feet from the inner end) and in repairing and strengthening the outer face works.

During the last fiscal year the sum of \$6,965.09 was expended in completing repairs undertaken in 1899-1900: in repairing and strengthening the work, 537 to 581 feet from the inner end; in constructing a crib-work block 15 by 20 feet on the seaward side, 220 feet from the inner end; in repairing and close-piling portions of the seaward face damaged while repairs were in progress; and in constructing and placing on the seaward side and at the outer end 255 cubic yards of concrete in blocks of from 7 to 11 tons.

The total expenditure to June 30, 1901, including \$25,000 for purchase of breakwater, is \$221,610.56.



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This work was transferred to the control of Marine and Fisheries on June 12, 1888.

## CRIBBIN'S POINT.

Cribbin's Point, Antigonish county, is on the west side of St. George's bay, 8 miles to the southward of Cape George, and 5 miles to the northward of the entrance to Antigonish harbour.

The wharf, completed in 1891-2, extends 300 feet in a southerly direction from the point, and has an approach 195 feet in length. It is 20 feet in width, on top, for a distance of 120 feet from the inner end, and 30 feet for the remaining 180 feet; the inner 50 feet being of stone, and the outer 250 feet of close-faced timber work, fully ballasted.

The face-timbers having become weakened by the ravages of the teredo, during the years 1896-7-8-9, the outer end, the seaward face for a distance of 20 feet and the inside face for a distance of 10 feet from the outer end were close-piled with creosoted timber piling; a talus of quarried stone was placed on the seaward side over a distance of 180 feet from the outer end; the work was reballasted where necessary, and a timber 'break' 100 feet in length and 2½ feet in height, above the cap timber, was constructed on the seaward side of the inner end of the wharf to prevent the sand from washing on to the work.

A sum of \$1,000 was appropriated for expenditure during 1899-1900 towards the construction of an extension, and the amount was expended in obtaining a portion of the creosoted timber required for the substructure of the proposed work.

During the year 1900-1 the sum of \$3,079.98 was expended in procuring the balance of the timber required for the extension and in repairing the outer end of the old work, which was almost destroyed during the severe gales in the autumn of 1900. The repairs consisted in the reconstruction of the top of the outer end of the wharf for a distance of 66 feet and to an average depth of 8 feet, and in placing heavy quarried stone in the talus on the seaward side of the reconstructed work.

As the sand at the end of the wharf, at which originally there were 11 feet of water, at low-water springs, had made up to a height of about 6 feet since its completion, it was deemed advisable to found the extension on the original bottom, and for that purpose the dredge *George McKenzie* was engaged from May 30 to July 12 in dredging out the foundation of the new work and the approaches thereto, at a cost of \$1,604.44.

The total expenditure on this work up to June 30, 1901, not including the cost of dredging, is \$15,634.12.

This work was transferred to control of Marine and Fisheries on October 2, 1895.

## DIGBY.

Digby, the capital of the county of Digby, with a population of about 1,500, is beautifully situated on the south-western end of the Annapolis basin. It is an important station on the Dominion Atlantic railway, 67 miles north from Yarmouth, 150 miles from Halifax, 20 miles from Annapolis, and is also a port of call for the daily steamer of the Dominion Atlantic railway plying between Digby and St. John. The harbour is open at all seasons, and well protected from nearly all quarters; storms, however, from the north and north-east, drive a heavy sea against the pier, and if at such times, there be much drift ice in the basin, the structure is likely to suffer damage.

The first pier was built by the government of Nova Scotia some years before confederation, and was nearly destroyed by the gales which swept the Bay of Fundy in 1866-7. In 1869, to aid in rebuilding the work, the sum of \$2,920 was granted by parliament and transferred to be expended by the provincial government. The pier, as



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then built, was of pile-bents 12 feet apart for 560 feet, next a block of crib-work 80 feet long, 45 feet wide, the southern half of which sloped so as to form an incline rendered necessary by the great rise and fall of the tide (27 at springs.) This incline was finished by a block 170 feet long by 22 feet wide, the northern half of this portion of the pier being all of pile-bents 8 feet apart. The outer end of the pier consisted of a block of 56 feet long, 45 feet wide and about 40 feet high. The whole of the northern face was close-piled, the total length of the structure being 870 feet.

In 1872, the sum of \$1,650 was expended by the department in completing and repairing the pier. In 1874, a number of piles and braces were renewed, the outer block newly fendered, and new joists and planking laid for the total length. During the gale of February 22, 1879, a schooner loaded with produce for the West Indies parted her cable and was swept bodily through the pier carrying away a length of 130 feet, which was rebuilt at a cost of \$2,367.73. In 1881-2, the sum of \$888.57 was expended in renewing a few piles and other timbers that had been eaten away by limnoria.

In December, 1885, the outer end of the pier was destroyed by a severe gale, and in 1885-6, the sum of \$1,945.62 was expended in repairs. In 1886-7, a further amount of \$767.62 was spent on the same repairs. In 1887-8, the sum of \$7,467.68 was expended in the construction of a block 40 x 40 feet on the site of the displaced outer block; of an inclined landing 26 feet wide and 80 feet long between the new outer block and the undestroyed inner portion of the pier, and the building of a roadway on pile and frame bents connecting the whole work with the new outer block. In January, 1888, operations were begun towards the rebuilding of the pier to its original length, and the departmental report for the year 1888-9 shows an expenditure of \$4,498.14. The new work consisted of a block 45 x 45 feet to replace the former one. It is built of round timber with double sets of face-logs, and is fully ballasted; it is 45 feet high, and connected with the older portions of the pier by a crib-work inclined landing, over the top of which a deck wharf is carried on heavy frame bents. The inclined landing and its superstructure is 25 feet wide. The inshore or pile-work section was strengthened and repaired in places, and parts of the worn and decayed plank covering were renewed. In 1889-90, heavy piles were driven along both the northern and southern sides of a centre block, which was shifted and damaged by a storm in December, 1885, to prevent any further movement. In 1890-1 and again in 1891-2, small expenditures were made in general repairs.

In 1890, a contract was entered into for the construction of a landing pier on a new site, viz., on the north side of the 'Racquet,' about a mile to the northward of the present pier and the town of Digby. For this purpose a quantity of timber and iron had been procured by the contractor. Owing, however, to numerous delays, and the death of the contractor, the intention of building this new pier was abandoned, and it was decided instead to repair and reconstruct the present pier, utilizing, as much as possible, the timber and iron belonging to the estate of the deceased contractor. The works of reconstruction were carried out by day labour at a cost of \$15,248.15.

In April, 1894, a length of 330 feet of the close piling along the north side of the pier together with the caps and walings for the same distance, and about ninety of the main outside bearing and fender piles were destroyed by a violent gale. In order to save the balance of the structure from the scouring action of the under-tow, set up by the sheet piling, the rest of it was immediately cut out, and the sheet-piling and other timber that had been knocked adrift was saved and piled up on the inner wharf. Subsequently in May and June, 1894, the sum of \$1,410.03 was expended in making good the damage done by the April storm. The sheet-piling having proved a mistake, it was not replaced, but about ninety new heavy piles were driven and thoroughly braced and bolted.

In 1895-6 the sum of \$4,341.99 was applied in filling with substantial, close-piled trestle work, a space or recess on the north side of the pier near its outer end, 210 feet long by an average width of 17 feet, and in raising from two to three feet and renewing the entire floor of the outer 225 feet in length.



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In 1896-7 the sum of \$3,132.89 was applied to the reconstruction of the southern half of the shore end of the pier for a length of 450 feet in substantial pile work; the new work was covered with 6-inch plank and securely capped, fendered and braced.

In the year 1898-9 the sum of \$579.80 was expended in the renewal and repair of the outer south corner of the pier which was damaged by being struck by the Dominion Atlantic Railway steamship *Prince Rupert* during a south-east blow in April, 1899. In addition to this 40 feet in length of the inclined slope was replanked with 6-inch plank, and a couple of new fender-piles were bolted in position.

In 1900-1 the sum of \$2,000 was expended in necessary renewals. The work done consists of the replanking of the wide part of the inclined slope 125 feet long by 25 feet wide, the narrow part, 87 feet long by 17 feet wide, and a portion of the floor of the main wharf 18 by 22 feet, with 6-inch spruce deals.

In addition to this an open shed, 100 feet long by 33 feet 6 inches wide, was erected on the outer end of the present shed and office, and over the inclined slip to protect freight when landed from steamers.

The importance of this pier may be judged from the fact that the annual collections for wharfage dues now amount to about \$2,500 per annum.

Spring tides rise 24 feet, neaps about 20 feet.

Total expenditure to June 30, 1901, is \$72,275.42, including refund of \$11,632 to provincial government in 1887-8, besides an expenditure of \$4,192.02 for dredging.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

#### EAGLE HEAD.

Eagle Head, Queen's county, is a fishing and farming settlement of about 200 people, situate on the eastern side of Eagle bay on the Atlantic coast, about 8 miles north-east of Liverpool. Several years previous to 1883 the provincial government built a stone breakwater 195 feet long and 20 to 25 feet wide on top.

During the year 1883 the Department of Public Works extended the work a length of 125 feet at a cost of \$2,500. It was then 320 feet long, from 20 to 27 feet wide on top, 16 feet high at the outer end, and the seaward and inner face sloped  $1\frac{1}{2}$  to 1 respectively. The top of the work was four feet above H.W.O.S.T. This breakwater is a great boon to the fishermen of the locality, affording protection to a fishing fleet comprising about 30 small boats, flats and whalers. They take, on an average, about 40 quintals of fish each annually.

Since 1894 this work has been more or less damaged, each year the damage becoming greater until it is doubtful if the work would have stood another winter.

In the year 1900-1 repairs were made and an extension of the breakwater built. The work consisted of replacing the top 4 feet of the old work, extending the new work a distance of 90 feet, and rip-rapping the outside of the entire structure. The new work is 90 feet in length, 32 feet in width on top, 56 feet at the bottom, and averages 16 feet in height. The same style of work as that used in the old structure was adopted with the exception that better material was procured, and much more careful work was performed. The top was most carefully laid, and the whole work takes the form of rough rubble masonry. It is proposed during the coming fiscal year to extend the work a distance of 30 feet more.

The expenditure during the fiscal year was \$3,388.13.

Total expenditure to June 30, 1901, \$7,232.05.

#### EAST CHEZZETCOOK.

East Chezzetcook, Halifax county, is situated on the east side of Chezzetcook inlet, with a population of about 800, principally engaged in fishing, farming and mining. The residents have always suffered much inconvenience in landing supplies, as the shore is separated from the narrow chanel by mud and sand flats from half ebb to half high water.



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To obviate this inconvenience, the construction of a wharf was commenced in May, 1900, to be 182 feet in length, 23 to 24 feet in width and 17 feet in height at the end. The first 70 feet is a stone bank, then 112 feet consisting of 12 trestle bents, 10 feet apart, strongly braced and waled; the first bent is placed butting the outer end of the stone work. The work will reach the shoreward or eastern edge of the channel.

On account of the difficulty in obtaining a pile-driver, it became necessary to construct one.

The wharf is of excellent workmanship, is easy of approach and should accommodate any size vessel which should now use the inlet.

Total expenditure to June 30, 1901, is \$1,729.45.

## EASTERN PASSAGE.

Eastern Passage, Halifax county, is situated about five miles south-east of Dartmouth, on the eastern side of Halifax harbour. It is an important fishing village of some five or six hundred people, whose chief pursuits are fishing and farming. A small brook which empties into a cove at this place kept a channel open for boats, but during the past three or four years the beach which protected the cove in which this channel is situate has been gradually moving inward, so that in a few years, unless arrested in its inward progress, the cove and beach will be useless.

In order to protect the beach, a long, low barrier was constructed, consisting of two rows of posts driven into the sand to a depth of from 4 to 5 feet, and having a common height of 3 feet above H.W.O.S.T. These posts were separated longitudinally 6 feet, and small logs were used as laterals. Loose brush and stone filled up the spaces, so that it was practically constructed of a light quality of stone-filled crib-work. This protection is 802 feet in length, 8 feet wide on top, and ranges from 6 to 8 feet in height. In order to prevent the beach from working around the outside end of this barrier, a spur 30 feet in length, 8 feet wide and 3 feet high, together with a break 300 feet in length, 6 feet wide on top and 5 feet in height, were constructed. The channel was deepened, 1,500 feet in length and 30 in width, to an average depth of 2 feet, whilst one section, 100 feet in length, was excavated an additional width of 30 feet, thus making this section 60 feet wide. The character of the workmanship is excellent; it stood the last winter without any damage, and is adequately suited to the purposes for which it was designed.

The expenditure during the fiscal year was \$2,000.

Spring tides rise 6 feet, neaps 5 feet.

## EAST PORT MEDWAY.

East Port Medway, Queen's county, is a settlement of about 300 people, situate about four miles north-east of Port Medway proper, on the east side of Port Medway harbour.

About the year 1860 the provincial government built a wharf which was used as a ferry landing, as well as accommodating the other requirements of the inhabitants.

In the fall of 1900 this wharf was reconstructed at a cost of \$1,669.25. The old structure was entirely removed; the rock bank, which formerly was 26 feet in length, is now extended to a length of 76 feet, with a width of 25 feet on top, and height of 10 feet at the outer end. From this point four cribs, each 20 feet long, separated by spans 18 feet in length, with a common width of 22 feet on top, have been constructed. The structure is very economically built of cribs of round logs, filled with ballast and properly fendered and covered with a good, substantial covering.



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## ECUM SECUM.

Ecum Secum Inlet, Guysboro county, is on the southern or Atlantic coast of Nova Scotia, 9 miles to the westward of Liscomb harbour, and near the boundary line between the counties of Guysboro and Halifax.

In order to make a shelter for fishing boats, and at the same time to enable steamers and vessels to call, on December 17, 1900, a contract was entered into for the construction of a public wharf.

The work under contract is 160 feet in length and 22 feet in width on top, with an 'L' on the eastern side of the outer end, 22 x 22 feet, and is a continuous native timber structure, fully ballasted, double fendered on the seaward face, the end and around the 'L,' and single fendered on the inside face; close-sheathed on the seaward face for a distance of 60 feet from the outer end, on the outer end and on the eastern face of the 'L.' The depth of water at the outer end, at low water springs, will be 10 feet. Spring tides rise 6 feet.

The materials necessary for the construction of the work were procured by the contractors, but no work had been done by the end of the fiscal year.

*P.S.—The work of construction was commenced on August 1, and fully completed on October 5, ultimo.*

Expenditure during fiscal year, \$99.30.

## ENGLISHTOWN.

Englishtown, Victoria county, is situated on the southern shore of, and immediately within the entrance to St. Ann's harbour (a fine basin 7 miles in length, about 2 miles in width, and carrying a depth of about 50 feet), at the head of St. Ann's bay, on the north-east coast of Cape Breton island.

On August 23, 1899, a contract was entered into for the construction of a wharf. The work of construction was commenced on May 29, 1900, and was completed in accordance with plan and specification on August 11 of the same year.

The wharf is 235 feet in length and consists of an approach 27½ feet in length and 20 feet in width on top, of 5 crib-work blocks each 20 x 20 feet, and of an outer block 20 x 40 feet, with openings between the blocks of 17½ feet. The blocks are constructed of round timber, laid open-faced with creosoted timber substructure, fully ballasted and fendered, and sheathed on the western faces, the outer end, and on the eastern face of the outer block.

The depth at extreme low water at the outer end, or along the channel face, is 12 feet.

Spring tides rise 5 feet.

Expenditure during fiscal year, \$2,836.08.

The total expenditure to June 30, 1901, is \$6,597.39.

## ESKASONI.

Eskasoni, Cape Breton county, is on the north side of East bay, an arm of the Great Bras d'Or lake, and about half-way between the head of the bay and Benacadie point, at the entrance to the lake.

On December 11, 1899, a report was submitted on the construction of a pile wharf, and its cost was estimated at \$2,100. This amount was granted for expenditure during 1900-1, and plan and specification for the proposed works were prepared.

The works specified consist of a pile-wharf and approach thereto, of a total length of 200 feet, and include a native round timber shore abutment, 40 feet long and 20 feet wide, and a pile-wharf, 140 feet long and 20 feet wide, with a pile-head 40 x 20 feet, all bearing piles to be of creosoted timber. The depth of water at the outer end, at low water lake level will be 10½ feet and at high lake level 11½ feet.

Tenders were asked for this work, and received, but the work was not let.

Expenditure for fiscal year, \$64.07.



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## FOX ISLAND.

Fox Island, Halifax county, is situated on the Atlantic coast of Nova Scotia, about 13 miles east of Halifax and about 900 feet from the mainland. It is a very small island, being some 3 or 4 acres in extent, and no point on it is more than 6 feet above H.W.O.S.T. It has no permanent inhabitants, but during the summer season is used as a fishing station by a number of fishermen. Until 1879 it was connected with the mainland by a shingle and gravel bar, which being bare at all times of tide, was used as a road for carts hauling supplies to the settlement on the island. Besides serving as a road the beach with the island formed a harbour for fishing boats. During the early part of 1880 the sea broke through this beach, and these inroads continued until 1885, when the beach ceased to afford adequate shelter or to serve as a means of communication between the mainland and the island.

To restore its usefulness the department in 1886-7 built beach protection works, extending over the whole length of the beach for a distance of 935 feet. This work consisted of round timber crib-work battering 1 to 4 on the sides, 13 feet wide on top, from 4 to 6 feet high with a stone slope of 2 to 1 on each side, extending up to 2 feet below the top. The whole crib-work was filled with stone to the level of the top timber.

In 1892 an extension was built 252 feet in length in order to protect the main part of the island.

During the past year the sum of \$1,243.63 was expended in rebuilding 410 feet in length with an average width of  $12\frac{1}{2}$  feet and a height of 6 feet. This work has been well and strongly built, and should prove durable and be in good repair for several years to come.

Total expenditure to June 30, 1901, is \$6,107.42.

## FRIAR'S HEAD.

Friar's Head, Inverness county, is on the west coast of Cape Breton island, 6 miles to the northward of the entrance to Margaree harbour.

Of the amount appropriated for expenditure in 1900-1, the sum of \$494.50 was expended in June in procuring part of the cement and other materials required in the construction of a concrete breakwater 90 feet in length, 4 feet in width on top, and 8 feet in height from 1 foot above low water; designed to close an opening in a ledge of rock lying parallel to the shore at a fishing station near Friar's Head, and affording partial shelter to a small wharf and to the anchorage for boats.

## GABARUS.

Gabarus bay, on the Atlantic coast of Cape Breton island, is 5 miles wide at the entrance between White Point and Cape Gabarus, and extends inland 5 miles.

On September 5, 1900, a contract was entered into for the construction of a breakwater at Harbour point, near the head of the bay. The contract is for a work 190 feet in length, including an inner section 70 feet in length and 16 feet in width on top, of round native timber laid open-faced and close-fendered on the seaward side; an outer section 120 feet in length and 24 feet in width on top, of squared timber, close-faced (the substructure to be of creosoted and the superstructure of native timber), and close-fendered on the seaward side, at the outer end, and on the inner side for a distance of 15 feet from the outer end. The top of the covering to be 5 feet above extreme high water, and the depth at extreme low water at the inner and outer ends of the second section, to be respectively 1 foot and  $12\frac{1}{2}$  feet.

Spring tides rise 5 feet.

Up to the end of the fiscal year the creosoted timber and part of the native timber for the work under contract had been delivered, but construction had not been commenced.

Expenditure during fiscal year, \$179.65.

Total expenditure to June 30, 1901, is \$3,294.65.



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## GEORGEVILLE.

Georgeville, Antigonish county, is on the southern shore of Northumberland strait,  $6\frac{1}{2}$  miles south-west from Cape George.

The wharf, as completed in 1891-2, was 207 feet long and 20 feet wide, with an 'L' 20 x 20 feet, making a width of 40 feet at the outer end, but during 1896-7-8 an extension 44 feet in length, 40 feet in width, with an 'L' 20 x 24 feet, was added thereto, making a width of 60 feet at the outer end. The total length of the wharf is now 251 feet, and 20 feet wide for a distance of 187 feet, 40 feet wide for a distance of 40 feet, and 60 feet wide for the remaining distance of 24 feet. The inner end of the wharf, for a distance of 87 feet, is of stone, floored over, and the remainder of the work of squared timber, close-faced and protected by sheathing and fenders. The depth of water at the outer end, at low water, is  $6\frac{1}{2}$  feet.

Spring tides rise  $4\frac{1}{2}$  feet.

During the severe north-west gale of September 12, 1900, which caused so much damage in the Gulf of St. Lawrence, the woodwork on the stone approach was partly lifted by the sea and moved several feet, and the sum of \$291.23 was expended in putting it back into position.

The total expenditure on this work up to June 30, 1901, is \$10,829.76.

## GRAND NARROWS.

Grand Narrows, Cape Breton county, is on the southern shore of Barra strait, which separates the Great from the Little Bras d'Or lake. It is an important station on the I.C.R., at the southern end of the railway bridge, which spans the strait at this place. It is also a place of call for steamers, which call twice a day with mails and passengers from and for Baddeck and make connection with the express trains going east and west.

The wharf is 287 feet in length, including 67 feet of crib-work filled with brush and stone and covered with gravel; 80 feet of pile-work, built in 1885-6 by the department over the remains of the outer portion of an old landing pier built by the provincial government; and an extension, 140 feet in length, built by the department in 1883-4. The extension consists of three blocks, each 20 x 20 feet, and an outer block 20 x 60 feet, of round timber crib-work, with openings of about 16 feet.

The depth of water at the outer end of the extension is 12 feet at low, or 13 feet at high lake level.

During the year 1891-2 the piles in one bent of the pile-work and the stringers were renewed; the outer block of the extension was raised and repaired, and its faces were close-piled; 25 fender piles were placed where required, and the covering over 165 feet of pile-work and extension was renewed.

The wharf has since fallen into a very delapidated condition, owing to natural decay and the ravages of the teredo, and during the year ended June 30, 1901, the sum of \$147.68 was expended in effecting temporary repairs to make it available as a landing place for the balance of the season.

The total expenditure up to June 30, 1901, on this work, including refund of \$1,289.70 paid to the provincial government, is \$5,686.95.

*Materials for the reconstruction of this wharf are now being obtained and construction will be commenced as soon as possible in the spring.*

This work was transferred to Marine and Fisheries Department on June 12, 1888.

## GREAT VILLAGE.

Great Village, Colchester county, is a thriving and enterprising village of about 1,000 people, situated on the north side of Cobequid bay, and on the Great Village river,  $1\frac{1}{2}$  miles above its mouth. It is 15 miles west of Truro, the county town, at the



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extreme head of the bay, and  $3\frac{1}{2}$  miles from Londonderry station, on the I.C.R. About 5 miles to the north is the village of Acadia Mines, with a population of 2,000, where are situated the works of the Londonderry Iron Company. The chief industries of the place are ship-building and farming, and, the surrounding country being prosperous and thickly settled, a considerable trade is done.

About the year 1865 a wharf was built on the left or west bank of the river, just below the village, by the Acadia Iron and Charcoal Company, for their own use, before the completion of the I.C.R. This wharf, with the land around it, and the other property of the Acadia Iron and Charcoal Company, was afterwards bought by the Steel Company of Canada, being subsequently transferred to the Londonderry Iron Company, the late owners of the mines. The wharf, of which the public always had the free use, was very roughly built of round-log crib-work. It had a finished length of 45 feet, and along the face a depth of 15 feet of water at H.W.O.S.T.

In the year 1891 the department built a new wharf on the site of the old one, 70 feet square on top, at a cost by contract of \$1,940. This work is substantially built of round-log crib-work, the three outer sides, which batter 1 to 12, being sheathed and double fendered. Its outer face is 19 feet high, affording 17 feet of water at H.W.O.S.T. The wharf is used during the shipping season by a large number of vessels landing general merchandise, and loading agricultural produce and a small quantity of lumber.

Repairs were made in 1892-3, in 1893-4 and 1894-5.

In 1900-1 the sum of \$239.53 was expended in renewing the whole of the floor, with stringers and guard timbers, and in raising and filling the approach with stone and gravel.

Total expenditure to June 30, 1901, is \$2,834.01 (and on river improvement, \$11,250).

## HARBOURVILLE.

Harbourville, King's county, is situated on the south shore of the Bay of Fundy, 53 miles north-east from Digby Gut. The population of the settlement is about 200 people, engaged in fishing and farming, the former being the staple industry. The harbour, which is only 400 feet long by 200 feet wide, and dry at low water, is formed by the mouth of Givan's brook, and affords at high water complete shelter from storms from all quarters to vessels drawing up to 14 feet of water.

The works here consist of two breakwaters or piers, one on either side of the entrance to the harbour. They were built many years ago, before confederation, by the provincial government, when the shipping business of the place was considerably greater than it has been since the opening of the Dominion Atlantic railway in 1868.

The western breakwater was extended by the department in 1876, at a cost of \$2,000, since which date numerous small expenditures, aggregating up to 1897 \$7,861.09, have been made in repairs and renewals, to one or other pier. Both works are of open-faced round-log crib-work, their outer ends being close-sheathed with flatted spars. In the year 1900, general repairs and improvements were made, consisting of the widening of the outer end of the western breakwater to the full width of the rest of the work (45 feet), and its extension one panel length (12 feet) also the extension of the eastern breakwater or wharf by a new piece 80 feet long and 20 feet wide, designed to protect vessels lying at the breakwater.

In 1900-1, an expenditure of \$500 was made in completing the extension begun the previous year, and in repairing the shoreward end of the older portion of the breakwater.

Spring tides rise here about 38 feet.

Total expenditure to June 30, 1901, is \$11,134.01, including a refund of \$323 to the provincial government in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.



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## HAULOVER.

Haulover, Shelburne county, is a boat canal with crib-work sides 1,208 feet long, 6 feet deep, crossing the isthmus that separates Port La'Tour from Negro Harbour. It is 16 miles in a direct line south-south-east of the town of Shelburne and 14 miles north-east from Cape Sable.

This cutting was made many years ago by the inhabitants, aided by the provincial government, to enable fishermen and others to pass from one harbour to the other, effecting a saving of a distance of seven to ten miles and avoiding the dangerous passage around Blanche point and the neighbouring shoals and ledges. The work, having been badly constructed in the beginning and no repairs having been made for some years, fell into a dilapidated condition and became almost impassable for small boats even at high water.

In 1890-1, the department expended the sum of \$3,000 in practically rebuilding the whole work. It was deepened and widened and the walls on both sides for its entire length rebuilt with round log stone filled crib-work.

During the last fiscal year the sum of \$500 was expended in effecting further repairs. The back of the channel was filled in with brush and stone, the channel was deepened for its entire length and the ends of the work were raised about one and a half feet in height. The work at present is 12 feet 6 inches wide at the bottom and 14 feet 6 inches wide at the top. At ordinary H.W.O.S.T. there is a depth of four feet six inches of water for its entire length which allows fishing boats to pass from two hours of flood to four hours ebb, or for eight out of every twelve hours.

## INGONISH (NORTH BAY).

Ingonish (north bay), Victoria county, is on the north-east or Atlantic coast of Cape Breton island, about midway between Sydney harbour and Cape North. It is separated from the south bay of Ingonish by a narrow, rocky and precipitous peninsula, over 2 miles in length.

On December 6, 1899, a contract was entered into for the construction of a breakwater at Archibald's point, on the north side of the bay, for the purpose of forming a harbour of refuge for fishing boats. The work was commenced on June 13, 1900, and brought to a satisfactory completion on December 20 of the same year.

The breakwater is 484 feet in length, with an L 77½ feet long, and from 18 feet wide at the inner to 24 feet at the outer end, and is constructed of squared timber, laid close-faced, with a creosoted timber substructure, fully ballasted and fendered, sheathed on the seaward face and end, and protected on the seaward face by a stone talus, extending from high water mark outwards, with a slope of 2½ to 1.

The depth of water along the face of the L, at low water springs, is 11 feet.

Spring tides rise 4 feet.

Expenditure for fiscal year 1901, \$24,118.

Total expenditure to June 30, 1901, is \$27,902.34.

## INGONISH (SOUTH BAY).

Ingonish bay, Victoria county, is situated on the east coast of Cape Breton island, about midway between Sydney harbour and Cape North. It is divided into north and south bays of Middle Head, a narrow, rocky precipitous peninsula, over 2 miles in length.

At the head of the south bay there is an extensive pond, separated from the sea by a beach, through which there formerly existed but a shallow channel.

In 1873 works were undertaken by the department for the improvement of the channel. On their completion in 1876 there was a channel 200 feet in width, with a



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depth of nowhere less than 14 feet, at low water, and with its northern side protected by a pier 500 feet in length, thus giving access for vessels to the pond, which has an area of about 400 acres and a great depth, and affords a safe commodious harbour.

The pier on which small sums were expended every year from 1876 to 1880, and larger amounts in 1881 and 1882, sustained serious damage during heavy easterly gales in 1882, and was subsequently carried away down to below water.

In 1886-7 an anchor and mooring buoy were placed in the harbour near the entrance, and a beach protection work, 58 feet in length and 20 feet in width was constructed on the northern side of the entrance to prevent the sea from cutting away the end of the beach, and opening up a channel between it and the remains of the old breakwater, and during 1894-5 a breach at the back of the beach protection work was closed with a crib-work block, 45 feet in length and 15 feet in width, and brush and stone placed at the sides.

In 1893-4 a public wharf was constructed on the northern side of and near the entrance to the harbour, consisting of a block of crib-work  $31\frac{1}{2}$  feet wide on top, and  $30\frac{1}{2}$  feet in length, with an approach of brush and stone, 45 feet in length and 20 feet in width on top. The depth of water at the outer end, at extreme low water, is 8 feet 3 inches.

During a severe easterly gale, accompanied by an extraordinary high tide, on February 4, 1895, the beach was swept from end to end. Nearly all the buildings and private wharfs were destroyed and carried away, but the public works were not disturbed, with the exception of some settlement in the slope on the seaward side of the beach protection work.

Since the destruction of the breakwater in 1882, the channel has been gradually contracting and getting shoaler, but it is still some 80 feet in width, and has a depth of 12 feet at low water.

During the last fiscal year the sum of \$30.58 was expended in replacing some sheathing on the outer corners of the block, constructed in 1886-7, which had been worn by the action of the running ice.

Spring tides rise 4 feet.

Total expenditure to June 30, 1901, is \$93,693.31.

## IRISH COVE.

Irish Cove, Cape Breton county, is on the south-east shore of the Great Bras d'Or lake, near the entrance to East bay. The distance to the head of East bay is 20 miles ; to St. Peters canal, about 22 miles, and across the lake to Grand Narrows, 10 miles.

The wharf, commenced in 1891-2 and completed the following year, is 160 feet 8 inches in length and 20 feet in width, including a shore block 47 feet in length, a central block 20 feet 4 inches in length, and an outer block 57 feet in length, with an 'L' 20 x 20 feet. The openings are respectively 17 feet 6 inches and 18 feet 10 inches. The depth at the outer end varies from 12 feet 3 inches to 13 feet at low lake level. It was strongly constructed, fully ballasted and had the exposed face of the outer block protected by close-piling.

During the last fiscal year (1900-1) the sum of \$103.31 was expended in continuing the renewal of close-piling of the outer block. Thirty-two piles were procured, of which 20 were placed.

The total expenditure to June 30, 1901, is \$3,349.25.

This work was transferred to control of Department of Marine and Fisheries on September 12, 1892.

## ISAAC'S HARBOUR.

Isaac's Harbour, Guysboro' county, is a small but safe harbour on the southern or Atlantic coast of Nova Scotia, situated about 36 miles to the westward of Cape



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Canso and 16 miles to the eastward from the entrance into St. Mary's river.

A contract for the construction of a public wharf on the western side of the harbour was entered into on November 2, 1900.

The work under contract is to extend a distance of 295 feet to 12 feet at low water, and is to consist of an abutment 135 feet long and 22 feet wide on top, with side and end walls of dry rubble masonry and centre filling of stone ; and of a block and span extension 160 feet in length, consisting of three blocks, each 22 x 22 feet and an outer block 22 x 48 feet, with openings of 18 feet between the blocks.

Spring tides rise 6 feet.

The construction of the abutment was commenced on November 16, and suspended for the winter on December 15. Work was again resumed in April, 1901, and at the end of the fiscal year the work was completed, excepting the placing of floor-stringers and covering on the outer block, about one-half of the cap-timbers and the sheathing and fendering on the outer face and southern end of the outer block.

Expenditure during fiscal year was \$2,971.86.

#### JONES HARBOUR.

Jones Harbour, Shelburne county, is situated on the eastern side of the mouth of Sable river and is distant 12 miles by water east of Lockeport. The harbour is small, but well sheltered on all sides, and, having 12 feet of water in the channel, it is much used by shore fishermen in the autumn, when the larger vessels return from the Banks. Owing to its position on the coast, there is a heavy run of tide in the harbour, and the fishermen had difficulty in properly securing their boats. In 1888-9 the department spent the sum of \$50 in placing moorings in the harbour. These consist of two ring-bolts in exposed rocks and a heavy stone anchor, with chain, swivel and buoy attached.

In 1889-90 the department spent the sum of \$1,000 in constructing a public landing wharf inside of the mouth of the harbour, to enable fishermen to use a larger class of boats, as well as to provide them with landing facilities. The wharf is 178 feet long, of which the shoreward 90 feet is built of stone, floored and fendered with timber, and the outer 88 feet is of stone-filled, round-log crib-work ; the outer 40 feet is 20 feet wide. At the outer end the work is 16 feet high. The work was built by day labour, and owing to the appropriation being exhausted, the shore end was left unfinished.

During the last year the sum of \$100 was expended in finishing this shore end.

Total expenditure to June 30, 1901, \$1,147.99.

#### KEMPT HEAD.

Kempt Head, Victoria county, is on the northern side of Boularderie island, on the Great Bras d'Or channel, and is about one mile from Boularderie Head, the extreme south-western end of the island.

A contract for the construction of a wharf was entered into on April 30, ult. The work under contract is 185 feet in length and consists of an approach of stone, clay and gravel, 10 feet long and 20 feet wide, on top ; of a crib-work abutment, 55 feet in length and 20 feet in width, of two crib-work blocks each 20 x 20 feet, and of an outer block 20 x 40 feet, with 20 feet openings between the blocks. The abutment and the blocks are to be of round timber, laid open-faced, creosoted up to high water, well protected with fenders, and the faces of the outer block and the end and side faces of the block next to it, with close-sheathing. The depth of water at the outer end, at low lake level, will be 12 feet, and at high lake level, 13½ feet.

At the end of the fiscal year, the work had not been commenced.

Expenditure during fiscal year was \$68.53.

#### LABILLE'S POINT.

Labille's Point, or L'Ardoise West, Richmond county, is on the eastern side of the entrance to Shaw's Cove, which is situated on the southern coast of Cape Breton island.



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about 7 miles to the south-eastward of the southern entrance to the St. Peter's canal, and one mile to the westward of L'Ardoise breakwater.

Shaw's Cove is very shoal, but it accommodates a large number of small fishing boats, and its eastern shore being the best protected from the sea, is used as a landing place for boats.

As it was found that Labille's point was wearing away, and the undertow sweeping around it, made the landing, at times, dangerous, during the last fiscal year the sum of \$485.44 was expended in the construction of a small breakwater at Labille's point.

The work extends to low water, and is 50 feet long and 12 feet wide, and consists of a stone abutment 10 feet long and a crib-work block, 40 feet long, fully ballasted and fendered and covered with large stone.

## LITTLE BRAS D'OR.

Little Bras d'Or (so-called). Cape Breton county, is a settlement on the north-eastern end of St. Andrew's channel, an arm of the Little Bras d'Or lake, and near the western entrance to Little Bras d'Or channel, which connects St. Andrew's channel with the Atlantic.

The sum of \$3,000 was granted for expenditure during 1900-1, towards the construction of a wharf, and on May 7, 1901, a contract for its construction was entered into.

The work under contract is 183 feet in length, measured on the centre line (including the L.), and consists of an approach of stone, clay and gravel, 16 feet in length of a crib-work abutment 40 feet long and 20 feet wide; of two crib-work blocks, each 16 x 20 feet, and of an outer block 50 feet long and 24 feet wide, with openings between the blocks. The abutment and the blocks are to be constructed of round timber, laid open-faced, creosoted up to high lake level and protected by fenders, and the faces of the outer block and of the block next to it with close-sheathing.

The depth of water along the channel face, at low lake level, will be 12 feet and at high lake level 13½ feet.

Up to the end of the fiscal year the work had not been started.

Expenditure during fiscal year was \$72.92.

## LITTLE BROOK.

Little Brook is situated on the thickly-settled east shore of St. Mary's bay, Bay of Fundy, 2½ miles from Church Point, 33 miles south from Digby, the county town, and 36 miles north of Yarmouth.

Some years prior to confederation a breakwater was built by the inhabitants, aided by the provincial government.

In 1873 four blocks of crib-work in the middle of the work were partially destroyed by a gale, and the sum of \$600 from the provincial 'Navigation Securities' was expended in repairs.

In 1891-2 the sum of \$100 was expended by the department in repairing the upper portions of the work, which were considerably damaged by an exceptionally high tide in the autumn of 1890. A piece 20 feet square by 5 feet deep was rebuilt, and 100 tons of additional ballast placed in the work.

This breakwater, which is substantially built of stone-filled crib-work of the usual type, is 400 feet long, 20 to 35 feet wide, and 20 feet high at the outer end, where there is an L 40 feet long by 25 feet wide. It is much used during the summer months for the shipment of piling, cordwood, lumber and timber, with small quantities of fish, and the landing of general merchandise and supplies for local trade and consumption. Little or no use is made of it in the winter owing to accumulation of ice. At high water of ordinary spring tides there is a depth of 15 feet of water at the outer end.

At low water the sand flats for many hundred feet are bare beyond the end.



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In 1900-1 the sum of \$279.32 was expended in taking down and rebuilding a portion of the outer end, 10 feet wide on top and 20 feet wide at bottom, and in renewing 44 feet in length of the floor with stringers and guards. This work is the repair of damages done by the great storm of March 1, 1900.

Spring tides rise 21 feet, neaps 17 feet.

Total expenditure to June 30, 1901, is \$560.07.

#### LIVINGSTON'S COVE.

Livingston's Cove, Antigonish county, is on the south-eastern shore of Northumberland strait, about 2 miles south-west from Cape George.

For the purpose of affording shelter for the fishing boats of the district, and a landing place for steamers and small vessels, a breakwater was constructed in 1899 and 1900. The work extends to 7 feet at low water springs, and includes a road cutting 105 feet in length, an embankment with stone retaining walls and centre filling of brush, stone and clay, 30 feet in length; 80 feet of crib-work 19 feet in width, with a grade of 1 in 8; and a crib-work extension 160 feet in length and 24 feet in width, with an L 24 x 24 feet. The crib-work is constructed with squared timber faces, laid with 7-inch openings, fully ballasted, fendered, and sheathed on the seaward side, the end around the L, and on 24 feet of the inside face.

Spring tides rise  $4\frac{1}{2}$  feet.

The substructure of the remaining portion of the crib-work extension, consisting of three blocks was constructed and placed in position, but before the outer block could be fully ballasted, on September 12, 1900, the work was subjected to the force of a terrific north-west gale, during which the sea tore the outer block from its position and washed it ashore, leaving some of the bottom timbers and a portion of the ballast flooring and ballast on the site it occupied. The season, after that, continued stormy; the work on the blocks in place was carried on to disadvantage, but they were finally completed to the required height.

As owing to the damaged condition of the bottom of the wrecked block, it could not be floated again, it was partly taken apart and the materials piled up ready to be used again.

Expenditure during fiscal year was \$2,822.53.

The total expenditure up to June 30, 1901, is \$8,568.60.

#### LOCKEPORT BREAKWATER.

Lockeport, Shelburne county, is situate on the Atlantic coast, about 14 miles south-east of Shelburne, and has a population of about 800. It has been, and is, one of the most important centres of fishing industry on the south coast of Nova Scotia. During the year 1898-9 the dredge *Canada* did a large amount of work in this harbour, but it was observed that, owing to the drifting of sand through the passage between the mainland and the small settlement known as Cranberry island, the channel was filling up, and this sand threatened in a short time to destroy the entire harbour. In order, therefore, to serve the business interests, it was considered necessary that this passage through which the sand floated should be closed. To do this the department decided to construct a breakwater across the passage, and during the year 1899-1900 the sum of \$2,948.98 was expended.

During the last fiscal year the sum of \$991.95 was expended in completing this work.

Its dimensions are 1,046 feet in length, 8 feet in width on top, and it has an average height of 8 feet. 910 feet of its length is constructed of stone-filled crib-work, and the remaining 136 feet, in length, consists of a rock bank.

The work, as complete, is a workmanlike and satisfactory structure.

Total expenditure to June 30, 1901, \$3,940.93, and \$15,853 for dredging.



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## LOCKEPORT BEACH PROTECTION.

This beach is probably one of the most important on the coast of Nova Scotia and lies at the back of the harbour of Lockeport.

During the last fiscal year the banks of sand and stone which protected the harbour from the ocean outside, were broken through and almost entirely destroyed. In consequence, it was necessary, in order to protect the harbour, that some protection should be constructed at this place. The sum of \$610 was expended in constructing this protection work, which is 1,240 feet in length, consists of two lines of posts, running lengthwise with the beach, 8 feet apart, and sunk into the sand to a depth of from 4 to 5 feet. The spaces between the planks outside are covered with 2-inch hemlock, well fastened, and the spaces between the posts on the inside are boarded with 1-inch hemlock to a height of 5 feet. This work seems to suit the purpose very well, and it is now almost covered up with the sand which has accumulated around and upon it.

## LOUIS HEAD.

Louis Head, Shelburne county, is a thrifty fishing settlement of about 100 people, situate on the west side of the mouth of Sable river, about 17 miles east of Shelburne and 10 miles from Lockeport. Many years ago, the provincial government protected a beach, which in turn protected a cove where boats sought shelter in time of storm.

In 1898-9 this work, having become decayed and no longer affording protection, was renewed and rebuilt by the department at a cost of \$600. It was then 230 feet in length, 10 feet in width on top, with a height at the outer end of 12 feet.

In the fiscal year 1900-1 the sum of \$199.76 was expended in extending this work a further distance of 30 feet. The whole work is built of stone-filled, open-faced, log crib-work, well fendered and upon solid foundations. The 30 feet constructed during the last year is placed upon foundations of brush and stone. The entire work should now be of sufficient length to prevent the sea from breaking around the end and destroying the small boat harbour which it protects.

Total expenditure to June 30, 1901, \$4,229.98.

## MABOU.

Mabou Harbour, Inverness county, is on the west coast of Cape Breton island, six miles north-east from Port Hood.

The entrance was formerly at the southern extremity of a range of sand hills by an intricate channel obstructed by a bar over which there was a depth of only 4 feet at low water.

In 1870 a survey was made and a report submitted on the project of opening a channel through the sand hills at their northern extremity.

The work was commenced in 1872. A pier on the south side of the new channel was completed in 1876, and the same year the old channel was closed. Expenditures were made nearly every year from 1876 to 1894 in repairs to the pier, the construction of brush and stone work on the south side and of protection works on the north side of the channel, and in dredging. In 1897-8 the sum of \$1,899.96 was expended in repairing the protection works on the north side and in raising the brush and stone work on the south side of the channel.

During the fiscal year 1900-1, the sum of \$999.15 was expended in removing what remained of the channel face of the pier on the south side, and in continuing the brush and stone work at the back of the pier 205 feet inwards. The brush and stone work is 16 feet in width, on top, and averages 6 feet in height.

The minimum depth at extreme low water in the channel is 8 feet 3 inches. Spring tides rise 4 feet.

The total expenditure to June 30, 1901, is \$132,051.49, and \$22,535.23 for dredging.



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## MALIGNANT COVE.

Malignant Cove, Antigonish county, is on the south-eastern shore of Northumberland strait, about midway between Arisaig and Georgeville, and distant from each about 4 miles.

The sum of \$5,000 was appropriated for expenditure, during 1899-1900, in opening a channel for boats through the gravel beach, into a small pond at the head of the cove, and in constructing protection works. During the year a plan and specification for works extending outside to 7 feet at low water springs were prepared, and the sum of \$3,893.35 was expended in procuring materials required in the construction.

The works proposed include the construction of piers placed 60 feet apart on each side of the channel, to be excavated to 2 feet at low water. The piers extending 248 feet inwards from low water outside, to be 10 feet in width, and to be founded at low water; those extending from low water outwards to be 16 feet wide on top, over 60 feet from their inner ends, and 22 feet in width over the outer 30 feet. All crib-work to be constructed of round native timber, laid open-faced, fully ballasted and close-sheathed at the ends and channel faces.

During the year 1900-1 the sum of \$6,123.64 was expended in the construction of the outer piers, each 90 feet in length, and of a portion of the inside pier on the eastern side of the channel, 188 feet in length.

Spring tides rise 4½ feet.

The total expenditure on this work up to June 30, 1901, is \$10,016.99.

## MARGAREE.

Margaree Harbour, at the mouth of the Margaree river, is on the west coast of Cape Breton island about 30 miles north-east of Port Hood. It has a narrow and intricate channel through which the tides run at the rate of 4 knots, and its entrance is obstructed by a bar of shifting sand over which there is, at times, a depth of only 5 feet at extreme low water.

Expenditures have been made by the department in the construction and maintenance of channel protection and improvement works on the west side of the entrance, and in the construction of beach protection works on the east side.

The works on the west side include : works built by the provincial government and extended by the department, and works of improvement in progress.

The old provincial government works (reconstructed by the department) extend 400 feet from the shore, across what was originally a false channel, to a large rock opposite the inner entrance and thence, at right angles, to the edge of the channel.

The work built by the department extends from the north side of the outer provincial government work, outwards, along the west side of the channel 595 feet. It is in four sections : 85 feet (built in 1876), 130 feet (built in 1879), 200 feet (built in 1890), and 180 feet (built in 1889), respectively 18, 16, 18 and 20 feet in width on top and 15, 14, 12 and 16 feet in height.

Each section is round timber, open-faced, and is fully ballasted, and close-fendered at the sides and outer ends. The top of the covering is from 4 feet 4 inches to 5 feet above extreme high water. The depth, at extreme low water, along the channel face varies from 7 to 2½ feet.

The improvements undertaken last year, but not completed, were : deepening along the channel face of the extension to 8 feet at low water over a distance of 200 feet, and the construction of a shear dam (within the entrance) 180 feet in length including 25 feet of brush and stone work, 11 feet wide on top; 100 feet of pile and brush work 10 feet wide; and 55 feet of crib-work 22 feet wide founded on brush work in from 1 foot 3 inches to 9 feet 9 inches at extreme low water.

During the year the sum of \$3,695.30 was expended, \$400 in repairing the channel face of the outer provincial government work; \$1,796 in procuring materials and con-



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structing the brush and stone work, the pile and brush work, and the superstructure of the crib-work of the shear dam ; and \$1,499.30 in about one-half the rock excavation required to give 8 feet at low water along the channel face of the extension.

Spring tides rise 4 feet.

The expenditure to June 30, 1901, including \$3,378 expended in beach protection work (east side) and refund of \$274.83 paid to provincial government, is \$24,479.58.

## MARGAREE ISLAND.

Margaree Island, Inverness county, is situated in the Gulf of St. Lawrence,  $2\frac{1}{2}$  miles off the western coast of Cape Breton island, and 27 miles north-east from Port Hood.

During 1899-1900 a wharf near the southern extremity of the island was built, 98 feet in length and 20 feet in width on top, consisting of a stone abutment 26 feet in length, and a crib-work block extending 72 feet to  $7\frac{1}{2}$  feet at low water.

During a gale on September 12, 1900, the 72-foot block, after losing its ballast, was moved 17 feet out of position, and the stone abutment was destroyed.

The expenditure during the fiscal year was \$1,205.53.

Total expenditure to June 30, 1901, is \$3,205.53.

## MARGARETVILLE.

Margaretville, Annapolis county, is the largest and most important village on the south coast of the Bay of Fundy, between Digby gut and Scott's bay; it is 42 miles north-east from the former, 36 miles south-west from the latter, and 8 miles north from Middleton, an important station on the Dominion Atlantic Railway. It has a population of about 500 engaged in fishing and farming.

A pier was begun here in 1837 by the provincial government, and subsequently extended to a length of 471 feet. The work was taken over by the Public Works Department in 1871, since which time it has had frequent renewals and repairs. In December, 1885, the pier was seriously damaged by a severe storm, a breach nearly 150 feet long being made clean through it, besides receiving other injuries. The Margaretville Pier Company transferred their title in the pier to the government on August 3, 1886. In 1886-7 the above damage was made good at a cost of \$4,419.92. In October, 1890, a severe gale made a breach of 117 feet in the outer portion of the work, besides doing other damage. In March, 1894, the remaining block, 86 feet in length, seawards from the 117 foot gap, was totally destroyed. In 1897-9 the outer block was rebuilt by contract at a cost of \$10,884. This new block, which is substantially built of round-log crib-work, close-sheathed on the seaward face and outer end, is 185 feet long, 42 feet wide, and from 22 to 23 feet high.

In 1900-1 the sum of \$500 was expended in renewing the floor on the shoreward end of the work, including planking, stringers, one course of longitudinal cross-logs, the greater portion of the area refloored, and putting in new guard timbers. In addition to this a considerable quantity of gravel was removed from the schooner berth alongside to give more room for vessel loading and unloading at the breakwater.

Spring tides rise about 30 feet.

Total expenditure to June 30, 1901, is \$35,784.64, including a refund of \$694.67 to the provincial government in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

Margaretville is one of the two places selected as eligible for the formation of a harbour of refuge ; Harbourville, 13 miles to the eastward being the other



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## MEDWAY RIVER.

Medway River, Queens county, is one of the most important rivers in Nova Scotia, and has its source in Lake Rossignol and its outlet on the Atlantic coast, about 10 miles east of Liverpool. In 1893-4 this department expended the sum of \$200 in removing rock from the channel at a place called Dock cove.

The sum expended this year was devoted to that part of the channel running from the Dock cove three miles up the river to a small settlement known as Mill Village. Quite a large amount of trade is being done along this river, and previous to the work just completed, these people had to team all their goods three and a half miles to the above mentioned Dock cove. There are also several lumber mills as well as the property of the Nova Scotia Wood Pulp and Paper Company situate at Mill village. Previously these people were unable to raft their lumber or boat their pulp to the wharf at Dock cove, but were compelled to employ much more expensive means, such as carting, to reach this point. The work had to be performed at extreme low spring tide. The work done during the year consisted of removing rocks, slabs and other obstructions from the channel, which is now free 40 feet in width, which accommodates all demands that may be made upon it. From 45 to 60 large rocks were removed and 150 cubic yards of old slabs and saw-dust excavated at a cost of \$497.11.

## METEGHAN.

Meteghan river, Digby county, empties into the Bay of Fundy at the mouth of St. Marys bay, almost directly opposite Grand Passage, between Long island and Brier island. It is 20 miles south of Weymouth, 28 miles north of Yarmouth and  $2\frac{1}{2}$  miles north of Meteghan, or Meteghan Cove. The population of the village is about 400 people, engaged in farming, fishing, lumbering and general trade. The nearest railway station on the Dominion Atlantic Railway, which runs parallel with the bay shore, is about 4 miles from the village. On the river, which is about 18 miles long, are some 20 saw-mills, most of which send lumber down to the mouth of the river for export to the West Indies and the United States, the total annual output aggregating over a million feet B.M.

The works here, which were built some years before confederation, presumably at the joint expense of the provincial government and the inhabitants, consist of two breakwaters, one on either side of the mouth of the river and inclosing an area of about 3 acres, in which, at H.W.O.S.T., is a depth of from 10 to 15 feet, giving ample berth accommodation and complete shelter to a large number of coasting and fishing vessels.

The north breakwater is about 400 feet long, 24 feet wide and 13 feet high at the outer end ; they are both built of stone-filled crib-work of the usual type. When the works came under charge of the department, the older portions were much decayed and extensive repairs were needed, which were made in 1873 at a cost of \$4,500. In 1881-2 the sum of \$2,000 was expended in rebuilding and repairing parts of both breakwaters. In 1882-3 the sum of \$3,000 was expended in close-piling and extending the south breakwater for a length of 80 feet, in general repairs to the north breakwater, and in removing from the dock a quantity of rocks and boulders, which was used as ballast in the new work. In 1890-91 \$265.19 was expended in removing from the channel, near the shore end of the south work, more rocks and boulders that interfered with the keels of vessels lying alongside ; slight repairs were also made under the same appropriation to both breakwaters. In 1898-99 the sum of \$4,110.76 was expended in extensive renewals to the shore end of the south breakwater ; the work taken down and rebuilt was 400 feet long, with an average width of 29 feet and an average height of 13 feet. This length was also newly close-sheathed, and on the shoreward side of the same portion a new break was built, 276 feet long and 8 feet high. In the fiscal year 1899-1900 the sum of \$4,199.98 was expended in continuing the work of



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restoration of the main breakwater, a length of 216 feet of the shore end of the work adjoining outwardly a portion of the work renewed the previous year, was taken down and thoroughly rebuilt.

In 1900-1 the sum of \$8,848.55 was expended in continuing the restoration of this work begun in 1898-9, and in removing gravel from the bottom of the stream between the two breakwaters ; 184 feet in length was taken down and rebuilt from the bottom an average width of 27 feet and from 18 to 19½ feet in height; the next 213 feet shorewards, which was rebuilt last year, was floored, including stringers, caps and planks.

Spring tides rise 21 feet, neaps 17 feet.

Total expenditure to June 30, 1901, is \$30,759.49.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

## METEGHAN.

Meteghan, Digby county, is situated on the south side of St. Mary's bay, 25 miles north of Yarmouth, 20 miles south of Weymouth, 2½ miles from Meteghan river and 40 miles from Digby, the county town. The nearest railway station, on the Dominion Atlantic railway, which runs approximately parallel to the coast, and has its terminus at Yarmouth, is about 7 miles distant. The whole coast of St. Mary's bay from Digby to Yarmouth is thickly settled, and is, in fact, almost one continuous straggling village for the whole distance of 67 miles.

Meteghan, next to Digby and Yarmouth, is the largest and most important settlement on the bay shore, having a population of 1,000 people, engaged in farming, fishing, lumbering and general trade.

The works consist of a breakwater and landing pier, both of crib-work, built between 1837 and 1860 by the provincial government and the inhabitants. The pier is about 300 feet long by 20 feet wide ; the breakwater, 20 to 26 feet wide, runs out for a distance of 925 feet from the shore, and has a return or 'L' of 85 feet at the outer end, which is 24 feet wide and 30 feet high, standing in from 25 to 27 feet depth of high water ordinary spring tides.

In 1875, at which date the work appears to have been taken over by the department, the breakwater was extended and repaired.

In 1878 an additional length of 100 feet was built with a portion of the 'L' at the outer end, at a cost of \$3,000 ; and in 1881 the sum of \$2,250 was expended in still further improving the structure by building an additional length of 50 feet on the 'L.' In 1882-3 the sum of \$500 was expended in reballasting and close-piling portions of the work and in other miscellaneous necessary repairs. In 1883-4 \$32 was expended in securing some of the fenders and a portion of the flooring at the outer end. In 1884-5 some damage caused by a severe gale of the previous November was made good at a cost of \$96.64 ; a breach 25 feet long and from 4 to 6 feet deep was refilled with solid work ; 40 feet of new break was added, and some new ballast put in to replace that washed out. In 1887-8 the seaward face of the breakwater was close-sheathed for 700 feet in length ; 575 feet on the inner face was repaired and sheathed, the whole work levelled up and some minor repairs executed ; the expenditure this year was \$1,447.33, which in the departmental report for the year is given as a refund to the provincial government on account of moneys expended by them between 1867 and 1879. In 1892-3 the department expended the sum of \$299.72 in making slight repairs to the breakwater and in temporary repairs to the landing wharf. In 1893-4 the sum of \$2,627.54 was expended in making thorough repairs to the landing pier and wharf ; the work done consisting of the rebuilding and face-fendering of the outer block 50 feet in length, building a new top and back 8 feet thick to the next length of 16 feet, and thoroughly refendering and capping the remainder of the work a length of 260 feet.



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In 1897-8 the sum of \$3,141.99 was expended in constructing a re-enforcing block along the whole length of the outer face of the L of the main breakwater. This work, which was rendered necessary by the eating away of the bottom timbers by the limnoria, and the consequent settlement of the breakwater, is 100 feet long, 12 feet wide, and 22 feet high. The upper portion of the L was also built 35 feet wide and 4 feet high, which restored it to the height of the rest of the work. The new work is well and substantially built of round-log crib-work, well fendered, ballasted and close-sheathed on all exterior faces. In 1898-9 the sum of \$1,093.20 was expended in renewing a length of 120 feet by 8 to 10 feet in height, and by 8 to 10 feet in width of the lower portion of the outer end of the seaward face of the breakwater, which had been eaten away by the limnoria; the work was close-sheathed for the same distance and for 40 feet on the inner side; about 10 feet in length of flooring was also renewed. A breach 30 feet long on the seaward side, adjacent shorewards to the 120 feet before mentioned, was also rebuilt. In the fiscal year 1899-1900 the sum of \$2,000 was expended in extensive renewals and repairs to the breakwater, the work done consisting of the rebuilding of 100 feet in length of the seaward face and 90 feet of the inner or shoreward face, about 8 feet wide, from top to bottom of the work, placing top cross-logs all across the breakwater to tie the new portions together, and a new floor on the portions renewed.

In 1900-1 the sum of \$3,499.95 was expended in rebuilding a serious breach made in the work by a severe gale on March 1, 1900. The new block, which had to be built from the bottom, is 180 feet long, 22 feet wide, and from 18 to 22 feet high. In addition to this a length of 221 feet of the top of the breakwater was refloored and partly close-sheathed, the floor having been destroyed by the storm referred to.

Spring tides rise about 21 feet, neaps 18 feet.

Total expenditure to June 30, 1901, is \$30,250.45, including a refund of \$1,447.33 paid to the provincial government in 1878-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

#### MONK'S HEAD.

Monk's Head, Antigonish county, is situated on the southern shore of St. George's bay, between the harbours of Antigonish and Pomquet. A large sheet of water to the westward of Monk's Head, known locally as Dunn's lake, is separated from the bay by a beach of sand, and from Antigonish harbour by a neck of marshy land.

During the years 1894-5-6 a channel for boats was opened between Dunn's lake and Antigonish harbour, and a highway bridge was constructed over it at its western end. The channel was about 700 feet in length, and was cut down to the level of low water springs, and had a width of about 4 feet at the bottom, with sides sloping about  $\frac{1}{2}$  to 1.

Owing to the soft nature of the bottom, soon after the completion of the work, the strong tidal currents deepened the channel, cut into the slopes and undermined the bridge abutments, causing the latter to settle some feet.

During the years 1896-7-8, the bridge opening was widened from 14 to 18 feet, the faces and sides of the abutments protected by piling, the superstructure renewed, and brush and stone protection work was placed on each side of the cut for a distance of 215 on the northern and 240 feet on the southern side.

Since the spring of 1898 the channel kept within its limits, but as the brush and stone work was being undermined in places, causing the materials to tumble into the cut, the sum of \$400 was set apart for repairing and strengthening the works during 1900-1.

Of the amount granted, the sum of \$399.96 was expended in reconstructing the brush and stone work, where necessary, and in securing this work in place by driving 8-inch posts, 5 feet apart, both on the face and rear of the works, secured by cross-ties and by longitudinal walings.

Spring tides rise 4 feet.

Total expenditure to June 30, 1901, is \$1,693.98.



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## MORDEN.

Morden, formerly called French Cross, King's county, is a small fishing and farming village of about 150 people, situated on the south shore of the Bay of Fundy, 50 miles north-east of Digby Gut, and 9 miles north from Aylesford station on the Dominion Atlantic Railway.

The pier or breakwater at this place, which is the most westerly in King's county, was begun in 1846, at the joint expense of the inhabitants and the provincial government. It is built of round-log crib-work, filled with ballast, close-sheathed on the seaward side and outer end. It is 365 feet in length, and varies in width from 28 feet at the shore end to 45 feet at the outer end, where it is 26 feet in height. It has had many repairs, renewals and extensions, of which the following are the most important :—

In 1896-7-8, 120 feet in length of the middle of the work, which was totally destroyed by violent gales in February and October, 1895, was thoroughly rebuilt. In 1898-9, this gap was completed and other important repairs effected and an accumulation of gravel removed from the inner side of the breakwater. In 1899-1900, 68 feet in length of the buttress on the seaward face of the work was rebuilt from the bottom to the full height of the breakwater. In November, 1899, a severe gale accompanied by exceptionally high seas broke over the work and destroyed 75 feet in length of the inner or shoreward side of the breakwater immediately abreast of the new seaward face. In November, 1900, another severe gale destroyed 22 feet in length of the outer end of the work, which was old and much decayed.

In 1900-1, the sum of \$3,829.89 was expended in rebuilding 75 feet of the eastern or shoreward side of the breakwater, which was destroyed in November, 1899, and in beginning the construction of an extension 50 feet in length to replace and supplement the 22 feet in length of the outer end of the work which was destroyed in November, 1900. The new block was brought to the full height by the end of the fiscal year, and at that date it lacked flooring, fenders, sheathing, mooring posts and break.

Spring tides rise about 34 feet.

Total expenditure to June 30, 1901, is \$16,458.01, including a refund of \$60 to the provincial government in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

## MCNAIR'S COVE.

McNair's Cove, Antigonish county, is on the west side of St. George's bay, 2 miles south from Cape George.

A breakwater 400 feet in length and 20 feet in width was built on the north side of the cove during 1872-3-4, and in 1878 a further length of 20 feet was added. In 1879 the work was carried away by drift ice, to within 100 feet of the shore end, down to from 6 to 3 feet below low water. During the summer of 1883, 70 feet of the shore end were rebuilt, and during the winter of 1884, the work was extended a length of 94 feet. In April, 1884, the 94 foot extension was badly damaged by drift ice and subsequently carried away.

During 1886-7-8, the bottom of the damaged work was dredged out and a work 160 feet in length, 34 feet in width on top, with a sloping face on the seaward side, was constructed, and on its completion the total length of the breakwater was 330 feet.

Owing to the damage by the teredo, during 1890-4 the outer end was protected with creosoted timber close piling, the bottom of the sloping face was close-fendered, and protected by a talus of quarried stone.

During 1897-8-9, a portion of the timber wall under the sloping face, which was partly destroyed by the teredo, was cut away for a distance of 80 feet, back to the first tier of longitudinals, and the newly made face was sheathed with hard-wood sheathing, 10 inches square ; a new ballast floor was placed longitudinally in the new face-cham-



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bers, and fully ballasted ; the covering was renewed and refastened where necessary, and additional stone was placed in the talus to secure the lower ends of the sheathing.

In 1899-1900, the sum of \$574.21 was expended in sheathing a further length of 53 feet of the outer face, in placing about 80 cubic yards of ballast in outer face-chambers and about 300 cubic yards of quarried stone in the talus, and in renewing cap-timbers, and three tiers of face timbers over a distance of 40 feet on the inner face, near the outer end.

During the last fiscal year, the sum of \$1,198.71 was expended in raising the stone talus all along the seaward face of the work up to half tide ; and the mouth of a small brook at the head of the cove which was continually shifting to the detriment of the boat landing was made permanent by the construction of a shear dam of brush and stone.

The depth of water at the outer end of the breakwater at low water is 13 feet. Spring tides rise 4 feet.

The total expenditure on this work up to June 30, 1901, is \$59,314.39, and \$6,751.18 for dredging.

#### NEIL'S HARBOUR.

Neil's Harbour, Victoria county, is situated on the eastern coast of Cape Breton island, about midway between Ingonish and Aspy bays.

The harbour is at the eastern entrance to a small bay opening to the south and south-east, and extending inland about half a mile. It is sheltered from the north and east by Neil's head, a rocky promontory from 10 to 20 feet above high-water springs, but is unsafe during gales from the south and south-east.

It is a large and important fishing station, and in order to protect the anchorage during south-easterly gales, on May 29, 1901, a contract was entered into for the construction of a breakwater, extending to 17 feet at low water, on the southern end of Neil's head.

The works under contract include a breakwater 226 feet in length and a road cutting 79 feet long and 20 feet wide at the bottom. The breakwater, excepting the inner end for a distance of 44 feet, which is to be built of round-timber crib-work, is to consist of close-faced, squared timber work, 20 feet wide on top for a distance of 114 feet ; 24 feet wide for a distance of 80 feet, and 56 feet wide for the remaining 32 feet. The work is to be fully ballasted, and sheathed on the seaward faces, the outer end, and on the inside face for a distance of 112 feet from the outer end. The substructure is to be of creosoted timber, and a heavy quarried stone talus is to be laid along the seaward face of the work.

Spring tides rise 4 feet.

Up to the end of the fiscal year, the work had not been commenced.

Expenditure during fiscal year was \$162.73.

#### NEW HARBOUR.

New Harbour Cove, Guysboro' county, is on the southern or Atlantic coast of Nova Scotia, 30 miles to the westward of Canso harbour. It is merely a shallow bay, open to the south-east. At the head of the cove is the entrance to St. Catherine river, which is navigable, for boats, 5 miles inland.

On May 19, 1900, a contract was entered into for the construction of a breakwater at Black point, on the western side of the cove. The work under contract included the construction of 240 feet of stone embankment, and 150 feet of crib-work, 25 feet in width, with creosoted timber substructure.

The work was commenced in May and was completed on September 27, 1900. The depth of water at the outer end, at low water, is 16½ feet.

Spring tides rise 6 feet.



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During a severe gale, in December, the stone embankment, near the junction with the crib-work, was partially destroyed, the crib-work was slightly damaged and the stone talus along the seaward face of the work almost completely swept away.

Expenditure during fiscal year, \$16,162.

Total expenditure on this work up to June 30, 1901, is \$17,470.59.

## NOEL.

The village of Noel, Hants county, population about 500, is situated on the south shore of Cobequid bay, the extreme eastern arm of the Bay of Fundy. It is 13 miles west of Maitland, and 32 miles north-west of Shubenacadie, the nearest railway station on the Intercolonial Railway. It is, at this date, almost exclusively a farming district; the export of lumber and timber, and the building of wooden ships, which some years ago were important industries, having practically ceased.

In 1889 a public wharf was built by the department by day labour. It consists of first, 35 feet in length of brush and stone causeway approach; next, a 30-foot block of crib-work, close-faced and filled to the top with stone and gravel; then, 203 feet in length of pile-work, 25 feet wide on top, with a double row of close-piling on the exposed or northern side, and an 'L' at the outer end, with a face length of 62 feet. Along the outer face of the 'L' the work is 24 feet high, having a depth of water at high-water springs of 21 feet.

Spring tides rise 50½ feet, neaps 43½ feet

In the fiscal year ended June 30, 1901, the sum of \$60.15 was expended in renewing the planking of the outer end of the wharf.

Total expenditure to June 30, 1901, is \$3,345.38.

This work was transferred to control of Department of Marine and Fisheries on October 5, 1898.

## NORTH WALLACE.

Wallace Harbour, Cumberland county, is situated on the south side of the Straits of Northumberland, about midway between Pictou harbour and Bay Verte. It is at the mouth of Wallace river and is well sheltered from all winds. On the south side of the harbour, which is about three-quarters of a mile wide, is situated the village of Wallace with a population of about 800 people. The industries of the place are chiefly farming and the quarrying and exporting of free-stone of which there are large and valuable beds in the immediate vicinity. Opposite the village a landing was constructed many years ago to accommodate the ferry service across the harbour, but as this was only available at and near high water the department in 1879 dredged a channel through the mud flats from the main channel of the river to the landing, a distance of about 1,600 feet with a width of 45 feet and a depth of 7 feet at L.W.O.S.T., which rise here 7 feet.

To prevent the inner end of the channel from filling up and to afford special facilities to the inhabitants of North Wallace and Fox harbour, the department in 1888-9 began the construction of a wharf, starting from the end of the public road, running past the remains of the old ferry landing on to the seaward side of the cut for 165 feet. In 1889-90 this wharf was extended a further distance of 180 feet and 20 feet in width with an 'L' on the eastern side of the outer end 20 feet long by 20 feet wide. The work throughout, except the fenders and floor stringers, was constructed of round timber crib-work. All faces are protected by fenders. A ballast floor was placed over its whole length, and thereon five feet in depth of stone ballast was placed. The top of the work was covered with 3-inch plank, and six mooring posts were put in place.

During the fiscal year, 1900-1, the sum of \$207.47 was expended in partially repairing this work. The repairs consisted of new flooring, stringers and a few fenders; further repairs are required to put the work in good condition.

Total expenditure to June 30, 1901, is \$5,662.62, and \$17,942.22 for dredging.



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## OGDEN'S POND.

Ogden's Pond, Antigonish county, lies on the south-western shore of St. George's bay, about 13 miles south from Cape George, and 9 miles from the town of Antigonish. It is a small sheet of water some 100 acres in extent, separated from the bay by a sand beach of from 130 to 250 feet in width.

The sum of \$2,500 was appropriated for expenditure during 1900-1, for cutting a channel through the beach to render the pond, which has a depth of over 10 feet at low water, accessible to boats and small craft, and for constructing a channel protection work on the northern side of the entrance.

The proposed cut is 925 feet in length and 30 feet in width at the bottom, and extends from 2 feet at low water in the pond to 3 feet of water in the bay. The protection work is to be 350 feet in length, and is to consist of brush and stone for a distance of 70 feet; of pile, brush and stone 10 feet wide for a distance of 260 feet, and of a round-timber crib-work block, 20 x 20 feet, with creosoted timber substructure.

Spring tides rise 4 feet.

Of the amount appropriated the sum of \$2,384.53 was expended during the fiscal year in procuring all the materials required, and in the construction of the brush and stone embankment, and of the pile, brush and stone work.

## OGILVIE'S.

Ogilvie' breakwater pier, King's county, is situated on the south shore of the Bay of Fundy, 55 miles east of Digby Gut, and 11 miles north of Aylesford on the Dominion Atlantic Railway. Like other ports on the Bay of Fundy shore in King's county, its trade has greatly declined since the construction of the Dominion Atlantic Railway, being now restricted to occasional shipments of cord-wood, fish and potatoes.

The work here, which serves both as a wharf and breakwater, was built about the year 1854, at the joint expense of the inhabitants and the provincial government. It is 270 feet long, 38 feet wide on top, and about 27 feet high at the outer end, built throughout of the ordinary type of round-log crib-work, and close-sheathed on the outer end. In 1884-5-6, the department expended the sum of \$3,156.63 in strengthening the outer end by building an entirely new block 20 feet long, and by taking down and rebuilding the old break for a length of 100 feet; in 1890-1, general repairs were made. In 1891-2, the sum of \$500 was spent in repairing and strengthening the shoreward end 90 feet in length. The face was taken down and rebuilt, being tied into the old work with new cross-ties, and the new work well filled with ballast. In 1897-8, a re-enforcing block on the shore end of the east side was built 153 feet long, 10 feet wide and to the full height of the work to support the breakwater which was leaning over and threatening to fall. In 1898-9, the sum of \$50 was expended in placing about a dozen new fenders to replace those broken and decayed, and in making a few other trifling repairs. In 1900-1 the sum of \$500 was expended in repairs to the shore end of the structure, the work done consisting of the rebuilding of the crib breastwork, supporting the road approach on the inner end and shoreward side, the renewal of about 40 feet of the flooring and the placing in position of 40 new hard-wood fenders on the seaward face to replace those worn out by the wash of the gravel.

Total expenditure to June 30, 1901, is \$6,339.02, including a refund to the provincial government of \$470 in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

## PARKER'S COVE.

Parker's Cove, Annapolis county, is a small indentation on the south-east shore of the Bay of Fundy, 15 miles north-west of Digby Gut, and 7 miles north of Annapolis, the county town. The population of the settlement is about 250 people, engaged in farming and fishing.



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In 1883-4, the department constructed a small breakwater, which was substantially built of round-log crib-work, stone-filled, 200 feet long,  $23\frac{1}{2}$  feet to 26 feet wide on top, and at the outer end 16 feet high, where at high tide there is a depth of about 11 feet of water.

In 1900-1, the department extended the breakwater a distance of 101 feet, by contract, at a cost of \$3,749. The new block is 26 feet wide on top, and from 16 to 19 feet high, substantially built of round-log crib-work, filled with ballast, well fendered and close sheathed on the seaward side and outer end. The work is in excellent condition.

Spring tides rise about 30 feet.

The expenditure during the fiscal year is \$2,891.23.

Total expenditure to June 30, 1901, is \$6,268.64.

## PARRSBORO' BEACH PROTECTION.

Parrsboro' Harbour, Cumberland county, is separated and protected from the open waters of the Minas basin by a gravel bar 1,800 feet in length, and from 50 to 250 feet wide at H.W.O.S.T. This bar projects in a north-easterly direction from the mainland on the south-west side of the mouth of the harbour. On the outer end of the bar is a lighthouse forming the harbour light. The bar being but 50 feet wide and only 4 or 5 feet above H.W.O.S.T. is also much exposed to south-west storms. It was considered necessary for the safety and stability of the lighthouse to protect it, and about the year 1881 or 1882 the Department of Marine and Fisheries built a work about 400 feet in length on the outer end and exposed sides of the bar. Some few years later this work was extended shoreward a distance of about 720 feet, presumably also by the Department of Marine and Fisheries. The central 450 feet was rebuilt by the Department of Marine and Fisheries in 1885, whilst in 1888 the western 225 feet was repaired by the Department of Public Works. This work was constructed of close-faced square timber crib-work, filled with gravel and planked over. It was 10 feet wide on top, and had a height of from 4 to 8 feet. During the storm of March 2, 1900, this work was totally destroyed, and owing to its importance as a protection it was deemed advisable to not only rebuild this work but to extend it some 150 feet in order to more fully protect the beach. Before the storm referred to, this department had assumed responsibility for 680 feet in length of the work, so that this 680 feet had to be constructed as well as an extension of 150 feet.

The old style of construction was faulty, being built of square timber, of little or no batter, close-faced and with very inadequate facings, the timber being partly joined with scarf joints with an occasional drift bolt, and the ballast used was not satisfactory, being taken from the beach and consisted of shingle or shale, but little larger than coarse gravel. As this kind of work was not considered suitable it was decided to reconstruct it upon a different plan. The new work is built of round-log crib-work with a batter of one in three on the seaward side, and one in six on the inner side, while it is sheathed on the seaward side and covered on top with 4-inch deals. The ballast used consisted of large stones which were quarried from adjoining quarries. The top of the work is inclined towards the shore one in eight. Before laying the bottom logs a depth of from two to three feet along the entire length of the work was excavated, thus giving an adequate foundation upon which to place the work itself. The sheathing runs from the bottom to the top, whilst for its entire length the work is ballasted to the top of the floor stringers.

During the fiscal year, 1900-1, the work was rebuilt for 580 feet in length, and one-half of the next 30 feet was constructed, thus leaving for completion the top half of 30 feet, 70 feet more of the old, besides 150 feet of extension. The width of the work is 8 feet on top and 14 on the bottom, and it is from 8 to 10 feet above the level of the top of the beach in height.

The expenditure during the fiscal year was \$5,000.

Total expenditure to June 30, 1901, is \$5,369.80.



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## PARRSBORO' WHARF.

Parrsboro', Cumberland county, is situated near the mouth of the Partridge Island river, on the north shore of the Basin of Minas, the south-eastern arm of the Bay of Fundy. It is an incorporated town of some 3,000 inhabitants, the terminus of the Cumberland Railway and Coal Company's Railway, and a very important shipping point for coal and lumber.

For the purpose of enabling steamers to keep up a regular (tidal) ferry service, between Parrsboro' and ports on the south shore of the Basin of Minas, many years ago a landing pier was constructed on Partridge island, on the sea shore, about  $2\frac{1}{2}$  miles south from the town. The pier is rapidly decaying, and will in a few years become a wreck, and owing to this fact, to its distance from the town, and the bad condition of the road leading to it, during spring and fall, it was thought advisable to construct a new landing wharf in a more convenient place.

The site selected for the new wharf is on the northern side of the mouth of the river, or the harbour so-called; it can be reached by a dry, level road, and is less than a mile from the centre of the town.

A contract for the construction of the wharf was entered into on November 2, 1900.

The works under contract have a total length of 375 feet, and are to be 35 feet wide on top, and include a road approach 25 feet in length, of gravel and clay; a block and span work, 140 feet in length and consisting of 3 crib-work blocks, of which the inner is 50 feet, the others 30 feet in length, with 15-foot openings between them, and constructed with squared timber, laid with 6-inch openings; pile work, 170 feet in length, including an inclined landing, 145 feet long and 9 feet wide at the side to enable the steamers to land and receive freight and passengers at different stages of the tide; and of crib-work head, 40 feet long and constructed in the same manner as described for blocks, in block and span work, but the three outer faces are to be sheathed from bottom to top with hardwood sheathing. The top of the work will be 5 feet above high water springs; the outer end will be 31 feet high, and have a depth of water at high water of 26 feet, but as spring tides rise here 42 feet the whole work will be high and dry at low water.

Work was commenced on June 1, 1901, and carried on in a vigorous manner, and at the end of the fiscal year the block and span work was nearly completed, and the outer block constructed up to a height of 18 feet.

Expenditure during fiscal year, \$5,000.

## PARTRIDGE ISLAND.

Parrsboro' pier or wharf, now known as Partridge island pier, Cumberland county, is situate on the north shore of the Basin of Minas, about 1 mile to the south-west of the lighthouse at the entrance to Parrsboro' harbour. It is 2 miles south of the village of Parrsboro', and has been the landing place for the steamers of the St. John New Brunswick and Basin of Minas route, which call regularly during the season.

It was built by the provincial government in 1864-5, and has subsequently received frequent and extensive repairs by this department. Being directly on the sea shore and though slightly protected by the headlands of Partridge island on the west, it is much exposed to south-east gales, though its chief source of danger lies in the heavy floating ice, which in the spring is carried backward and forward by the ebb and flood.

The work is 431 feet in length, and from 27 to 29 feet in width on top; the height at the outer end is 33 feet. It was originally strongly and substantially built of square timber, close-faced crib-work. The floor of the shoreward end for a distance of 310 feet is 2 feet above H.W.O.S.T. Then, for a distance of 60 feet, it slopes downward about 4 feet. On the inner or western side of the outer end is a narrow inclined landing, 74 feet wide, for the convenience of landing passengers and freight at all times of tide. Spring tides rise 41 feet, neaps 34. Low-water mark is about 100 feet beyond the end of the wharf.



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During the fiscal year 1900-1 the sum of \$878.77 was expended in repairing this pier. The covering for a length of 175 feet was renewed, 4 feet of the top work for 100 feet was also renewed, requiring about 100 tons of extra ballast, and 24 fenders placed on the seaward side in order to keep the outer face of the work in proper condition. The entire structure was bulged out from 6 inches to a foot, and urgent measures were required to repair it properly. During the early part of the fall of 1900 this pier was again badly damaged, but at places farther out than where formerly repaired. This work will in the future be but little used, as the department is at the present time constructing a landing pier at the mouth of Parrsboro' harbour. To repair the present work properly would cost some two or three thousand dollars, so that any further repairs to be done to this work should be of a temporary nature only. The pier might be either disposed of by auction or else allowed to go down, as, after the new pier is constructed, it will be of no practical use.

Total expenditure to June 30, 1901, is \$7,664.59, including \$1,674.80, refund to provincial government.

This pier was transferred to control of Department of Marine and Fisheries, June 12, 1888.

## PETIT DE GRAT.

Petit de Grat inlet, Richmond county, lies between Petit de Grat island and the eastern extremity of Isle Madame. The main entrance is at the southern end from the Atlantic. The northern entrance from Rocky bay is obstructed by outer and inner bars, through which passages for boats, at ordinary low water, were opened by the department in 1879-82.

In 1898-9 both channels were widened and improved by hand-dredging, and a protection work of round timber and stone, 10 feet in width and  $3\frac{1}{2}$  in height from  $1\frac{1}{2}$  feet below low water (with the exception of the outer 21 feet, which is 17 feet wide and  $2\frac{1}{2}$  feet above extreme high water) was constructed on the western side of the outer channel, over a distance of 210 feet, or to within 85 feet of the outer end.

In 1899-1900 the protection work was extended inwards 88 feet and raised 10 inches, and the outer channel was further improved.

During 1900-1 the sum of \$500 was expended in raising the protection work (except the outer 21 feet) a height of  $2\frac{1}{2}$  feet, in placing a talus of heavy stone at the back of the protection work, and in deepening the inner portion of the outer channel.

The outer channel is about 350 feet in length, 25 feet in width and has a depth of about 2 feet at low-water springs ; while the inner is about 285 feet long, 20 feet wide, with the same depth as the outer channel.

The protection work is 298 feet in length and consists of ordinary rough round-timber crib-work, fully ballasted, but not covered. For a distance of 277 feet it is 10 feet wide, 6 feet 10 inches high, and the top is 8 inches below high-water springs ; and the outer 21 feet is 17 feet wide, 9 feet high, and its top is  $1\frac{1}{2}$  feet above high-water springs.

Spring tides rise 6 feet.

The beach of the eastern side of the outer channel is moving to the westward, and there is a possibility of its eventually closing that channel.

The total expenditure up to June 30, 1901, is \$5,250.

## PICTOU LIGHT BEACH.

The beach forming the southern side of the entrance to Pictou harbour, known as 'Pictou Light Beach,' extends about one mile in a northerly direction, inclosing Moodie cove, an inlet nearly dry at low water except in a central channel. The outer end, on which stands a lighthouse and keepers' dwelling, is protected by a breastwork of squared timber 450 feet in length, and by a work of brush and stone extending from side to side



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opposite the southern extremity of the breast-work, and inclosing property under the control of the Department of Marine and Fisheries.

In 1894-5, the sum of \$300 was expended in acquiring a title to a portion of the beach, 1,520 feet in length, adjoining the property of the Department of Marine and Fisheries.

During the years 1898-9 and 1899-1900, the sum of \$2,372.28 was expended in the construction of works to protect the beach which was swept by the great gale in August, 1873, and had been more or less damaged by succeeding storms. The works included a work of brush and stone 10 feet wide on top and 4 feet in height founded at one foot above extreme high water and extending 1,030 feet from the southern end of the breast-work protecting the property of the Department of Marine and Fisheries ; and two groins respectively 65 and 55 feet in length, 5 feet in width and 5 feet in height with inner ends 5 and outer ends 2 feet above high water made by driving piles in pairs 5 feet apart, filling in with brush secured by cross cap-timbers, and close-piling at the outer ends ; one of these is opposite the southern end of the breast-work and the other opposite the brush work 200 feet to the southward.

During the last fiscal year the sum of \$522.77 was expended, \$442.67 in October and November in constructing a groin 75 feet in length opposite the breast work 200 feet to the northward of the first groin ; \$7.50 in March and April in removing the pile driving machine to Pietou ; and \$72.60 in June, in repairing the brush and stone work.

The groin completed in November was undermined and destroyed during a heavy easterly gale early in December.

The total expenditure to June 30, 1901, including \$300, paid for acquiring a title to part of the beach in 1894, is \$3,195.05.

#### PLYMPTON.

Plympton, Digby county, is a fishing and farming village of 200 or 300 people, situated on the east shore, and near the head of St. Mary's bay, 12 miles south-west from Digby and 8 miles north-east of Weymouth.

Some years before confederation the provincial government built a wharf of crib-work, 230 feet long, 35 feet wide and at the outer end 22 feet high, giving at H.W.O. S.T. a depth of 19 feet of water.

In 1874-5, the department extended the work by a block 34 feet square on the outer end.

In 1900-1, extensive repairs were made at an expenditure of \$1,200. The north side and shoreward end was rebuilt from the bottom, a length of 156 feet, a width of 10 feet at the top and about 15 feet at the bottom, by a height of from 4 feet to 17 feet ; the outer 66 feet in length was also repaired by placing two new longitudinals on each side, besides a new top piece to the break and seven new mooring posts.

Spring tides rise 22 feet, neaps 18 feet.

Total expenditure to June 30, 1901, is \$4,843.97, including a refund of \$100 to the provincial government in 1887-8.

This work was tranferred to control of Department of Marine and Fisheries on June 12, 1888.

#### PORTER'S LAKE.

Porter's lake is a long and narrow sheet of water lying nearly north and south and situated about the middle of Halifax county or about 15 miles east of the city itself. It is about 17 miles in length from a quarter to a half mile in width and the water being of good depth for almost its entire length renders it navigable for vessels of sixty tons or less to the extreme head. The lake, which for a long time stood at a nearly constant level of a few inches above high water of ordinary neap tides, discharged its waters directly into the Atlantic through a beach of gravel and sand from one to two



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hundred feet wide. Up to about 1873 this outlet was navigable for schooners drawing 6 feet of water and considerable traffic was then done on this lake in the export of timber, lumber, cord-wood, general farm produce and fish. Since that time, owing to the gradual filling up of the outlet by the sand and gravel of the beach, under the action of heavy seas, the traffic in the lake has ceased and large areas of fine timber lands surrounding its head are lying practically unused from the difficulty of access to market. While the outlet was open a considerable quantity of fish, salmon, alewives and smelt used to be taken in the lake but this industry has likewise ceased for similar reasons.

A number of attempts have been made to obtain a temporary opening but they only met with failure because of the exposed position of these beaches. Numerous schemes have been developed but so great was their probable cost that the department has been unable to undertake them.

In the month of October, 1899, an attempt to make this temporary opening, at the site which had been before worked on, by constructing a channel 90 feet in length, 60 feet in width, with an average depth of 10 feet. In addition to excavating this channel a timber breakwater, about 90 feet in length and 10 feet wide, was constructed; as its temporary character was a matter of experiment it did not justify any extensive outlay. Since that date, however, the impracticability of the temporary opening has been fully demonstrated. The sum of \$8,262.44 was expended and it will probably take \$6,000 more to complete the work. During the past three years the roads during the winter, late fall and early spring, have been impassable and communication between the city of Halifax and this populous section of the country has been practically cut off, thus causing much inconvenience and loss to the interests of these people.

## PORT GEORGE.

Port George, Annapolis county, is a village of some 400 people, situated on the south shore of the Bay of Fundy, 37 miles north-east of Digby gut, 42 miles south-west from Scott's bay, 6 miles south-west from Margaretsville, and 7 miles north-west from Middleton on the Dominion Atlantic Railway.

Some years before confederation the provincial government built a western breakwater and an eastern pier or wharf. The breakwater is 440 feet long, and from 25 to 35 feet wide on top, and at the outer end, where there is about 21 feet of water at H.W. O.S.T., it is 25 feet high. It is built of round-log, stone-filled crib-work, the western or seaward face and outer end being close-sheathed.

The wharf on the eastern side of the little harbour is 205 feet long, 20 feet wide, and 18 feet high at the outer end. It is built of round-log crib-work, and the outer end, on which stands a small lighthouse is close-sheathed. In 1874 the harbour was taken in charge by the Public Works Department, and in that and the following year the sum of \$7,000 was expended in repairing and refacing the breakwater which was much decayed. In the autumn of 1888 the outer end of the breakwater was destroyed by a severe storm, 165 feet in length being wrecked, and an additional length of 30 feet being much injured. Before repairs could be made a second storm destroyed the damaged portion, leaving 195 feet of the work a complete wreck, and rendering the harbour practically useless. In 1890-1 the destroyed portion of the work was rebuilt by contract. In April, 1894, an exceptionally severe north-east gale caused a serious breach in the breakwater at about midway of its length, or immediately shorewards from the new outer block; the breach was 40 feet long for the full width of the work, and about 17 feet high. It was rebuilt in the autumn of the same year.

Spring tides rise 30 feet.

In 1900-1 the sum of \$400 was expended in repairing the eastern breakwater wharf; the outer 30 feet in length was refloored, and the close-sheathing for the same length was renewed. New fenders, guard timbers and mooring posts were also placed. The sum of \$1,653.60 was also expended in beginning the construction of a detached break-



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water lying about 200 feet outwards from the end of the main work. The object of this is to break the seas and afford much needed shelter to schooners lying alongside the breakwater.

Total expenditure to June 30, 1901, is \$25,756.08, including a refund of \$1,076.75 to the provincial government in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

## PORT HILLFORD.

Port Hillford, Guysboro' county, is at the head of Indian bay, on the southern or Atlantic coast of Nova Scotia, 5 miles to the eastward of the mouth of St. Mary's river.

A contract was entered into in September, 1899, for the construction of a breakwater on the east side and near the head of the bay. The contract was for a work 300 feet in length and 22 feet in width on top, with an L 22 x 22 feet, of open-faced crib-work, protected on the seaward side and at the outer end by hardwood sheathing. The depth at the outer end, at extreme low water, as shown on contract plan, was 9 feet.

The work of construction was commenced on May 18, 1900, and prosecuted vigorously up to the end of the fiscal year, when about one-sixth of the work under contract had been performed, and in September it was completed.

Some settlement occurred during a gale on the 14th August, and an agreement was entered into with the contractors for placing 200 cubic yards of compressed brush and 440 cubic yards of stone on the seaward side and at the outer end to prevent scour. This extra work, involving an expenditure of \$920, was commenced on 3rd October, and completed on the 14th November. While it was in progress a further and very serious settlement occurred during a gale on the 11th October. Measurements taken on 1st December show a settlement of from 3 feet, 100 feet from the inner end to 6 feet at the outer end, and of 8 feet 9 inches at the north-east corner of the 'L.'

Spring tides rise 6 feet.

Expenditure during fiscal year was \$5,884.

The total expenditure up to June 30, 1901, is \$8,125.19.

## PORT HOOD.

Port Hood, the shiretown of the county of Inverness, is on the west coast of Cape Breton island, 20 miles north of the northern entrance to the Strait of Canso.

The harbour was formerly a secure one; Smith's island, which is 2 miles in length and forms its west side, having been connected at its northern end with the mainland by a range of sand hills. In 1839 the sea made a breach through this protection; the opening, at first narrow, was enlarged by the tidal currents with increasing rapidity, until it was entirely swept away and its site occupied by 15 feet of water. The harbour is now unsafe during northerly gales, except in a small cove on the east side of Smith's island.

A pier on the east side of the harbour, commenced by the provincial government in 1865, was originally 550 feet in length and 24 feet in width, with an 'L' on the south side of the outer end 100 feet in length and 25 feet in width. It came under the charge of the federal government in 1871 since which time extensive repairs and renewals have been made, including the construction of a new block 125 x 25 feet at the outer end, in 1873; the construction of a block 50 x 32 feet at the south end of the 'L,' in 1888-9, and the construction of a block 71 x 24 feet at the outer end, in 1889-90. The old provincial government work was of square timber, close-faced; the additions and parts reconstructed by the department are of round timber, laid open-faced. The pier has been protected on the seaward side, at the outer end, and on the south end and inner side of the 'L,' by close-piling, and on both sides to within 74 feet of the outer end by a stone talus.



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During the last fiscal year the sum of \$820.38 was expended in continuing the repairs to the outer end, in renewing close-piling, and in reballasting 70 feet of the seaward face, near the outer end.

The depth of water at the outer end, at low water, is from 12 to 15 feet.

Spring tides rise 4 feet.

The total expenditure up to June 30, 1901, including the sum of \$916.11 refunded to the local government, is \$58,654.84 ; and \$1,943.60 for dredging.

## PORT HOOD ISLAND.

Port Hood, or Smith's Island, Inverness county, is situated from 1 to 1½ miles off the west coast of Cape Breton island, 22 miles northward of the northern entrance to the Strait of Canso. It is 2 miles in length, and forms the western side of Port Hood harbour.

The only safe anchorage in Port Hood harbour is formed by the east side of Smith's island and a shoal extending southward from Smith's point, near its northern extremity.

During the last fiscal year the sum of \$999.68 was expended in reconstructing 33 feet of the outer end of an old provincial government beach protection work at Smith's point, and in extending it 67 feet. The new work is 20 feet in width, of round timber, open-faced, sheathed at outer end and on the south side, and fully ballasted. The depth at extreme low water at the outer end is 1½ feet.

Spring tides rise 4 feet.

Total expenditure to June 30, 1901, including refund of \$654.47 to provincial government, is \$1,654.15.

## PORT LORNE.

Port Lorne, formerly called Port Williams, or Marshall's Cove, Annapolis county, is situated on the Bay of Fundy, 32 miles north-east from Digby Gut, and 6 miles north-west from Paradise station, on the Dominion Atlantic Railway. The settlement comprises about 300 people engaged in fishing and farming.

The breakwater was begun in 1835 at the joint expense of the inhabitants and the provincial government, the outlay on the work up to 1887 being about \$16,000. The first work done by the Department of Public Works was in 1873-4, when the breakwater was extended a length of 67 feet. In 1882-84 the work was extended a length of 100 feet, width 35 feet, and height 25 feet. The new block was built close-faced with square timber, both inside and outside, and provided with a break 4 feet high. During the next few years several repairs were made. In 1897-8 a re-enforcing block was built on the seaward face of the outer end of the breakwater 78 feet long, 27 feet high and 13 feet wide, in addition to other important repairs made.

In 1900-1 the sum of \$2,186 was expended in important repairs. The work done consists of the building, to the full height of the breakwater, a portion of buttress on the seaward side, 91 feet long ; the rebuilding of 12 feet in length of the top of the main work immediately shorewards from the new portion of buttress, and the reflooring of the greater part of the length of 91 feet, abreast of the buttress.

Spring tides rise about 30 feet.

Total expenditure to June 30, 1901, is \$18,140.63, including a refund to the provincial government of \$1,589.33 in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

## PORT MAITLAND.

Port Maitland, Yarmouth county, is a prosperous and important fishing and farming vilage, with a population of about 400, situated on the south-east side of the mouth of the Bay of Fundy, 12 miles north of the county town of Yarmouth.

The harbour works were begun about the year 1859, by the provincial government ;



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they consist of an eastern and western, or main, breakwater of crib-work. The former is 400 feet long and some 20 feet wide, and the latter 500 feet long, 22 to 25 feet wide, with a return 54 feet long, 24 feet wide and 27 feet high, along which there is a depth of 19 feet at H.W.O.S.T. These breakwaters or piers inclose between them a snug high-water harbour of  $2\frac{1}{4}$  acres in extent.

In 1873-4, the eastern breakwater was raised and widened for a length of 158 feet on the shore end and an extension 50 feet in length was built on the outer end of the western breakwater. In 1885-6, the sum of \$349.92 was expended in raising the outer end of the eastern breakwater, and in repairing and partly renewing the sheathing of the outer face of the western breakwater. During the early part of the winter of 1887-8 the western breakwater was seriously damaged by a series of storms, and a breach 86 feet in length was made directly through the middle of the work ; the sum of \$53.65 was spent in urgent repairs, and in the following year, 1888-9, the wreckage was cleared away, both sides of the breach closed up, and a number of fender piles were driven along the outer face and exposed corners of the broken work at a cost of \$497.33.

On June 24, 1890, a contract was made for rebuilding the destroyed section and repairing the other parts of the work. The wreckage of the old work was removed down to its foundations, and the breach filled in and rebuilt entirely with new and substantial work. The rest of the seaward face, *i.e.*, 83 feet in length outside the new work, and 100 feet between it and the shore, was close-piled ; the entire top, including the cap, covering, floor stringers, the first set of cross-ties, and the break of those two sections was rebuilt, and new fenders were fitted to the inside face. In 1891-2, the sum of \$298.45 was expended in repairing the eastern breakwater, the work consisting of the removal and rebuilding of almost the entire top to a depth of 3 feet.

In 1895-6, \$271.71 was spent in purchasing materials for repairs to consist of rebuilding the shore end of the north side of the western breakwater, 90 feet long, 10 to 12 feet wide and 15 feet high ; the labour was furnished gratis by the inhabitants. In 1896-7, the sum of \$3,304.79 was expended on extensive repairs and renewals to both works. On the eastern breakwater, which also serves as a wharf for the landing and loading of general merchandise, coal, lumber, &c., the shoreward 30 feet was rebuilt on the south side 6 logs high, and on the north side 3 logs high, including floor stringers and covering ; 22 feet in length of the new covering was laid on the outer end, and a number of new fenders were bolted into position. On the western breakwater a re-enforcing block was built on the south side of the outer end, 97 feet long, 11 feet wide, and 12 to 14 feet high, or to a height of about 10 feet below the floor of the work ; a re-enforcing block was also begun along the whole length of the ' L ' 70 feet in length and from 10 to 12 feet wide. To obviate settlement, due to soft bottom and the eating away of the bottom logs by the limnoria, which was the cause leading to the necessity of constructing this block, it was built on 147 piles driven to hard bottom and cut off level with the beach. The inner or north side of the shoreward end was also strengthened and rebuilt. In 1897-8 the sum of \$3,600 was expended in further repairs and renewals to the breakwaters, the re-enforcing block along the ' L ' of the western breakwater was completed to the full height of the work, and the inner face of the other end was renewed. The buttress on the outer side was extended shorewards a length of 122 feet. On the end of the eastern breakwater the ' T ' was rebuilt 50 feet long, 20 feet wide, and built on 21 piles driven to hard bottom and cut off level with the beach. Various miscellaneous and necessary repairs were also effected.

In 1898-9 the sum of \$700 was expended in completing the thorough and extensive repairs to the western breakwater ; 60 feet long on the inner face was close-sheathed, the buttress on the seaward side, 140 feet long, was finished and several vacant spaces in the shoreward end were filled with ballast.

In 1899-1900, the sum of \$2,118.87 was expended in rebuilding the re-enforcing buttress on the outer end seaward face of the breakwater, 96 feet long, 10 to 12 feet wide, to the full height of the work. The lower 12 feet of this work, and the outer end of the work were also sheathed with 4-inch creosoted plank as a protection against the limnoria.



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In 1900-1, the sum of \$1,017.66 was expended in building a piece of buttress on the seaward side of the breakwater 90 feet in length, 19 to 20 feet high and from 10 to 11 feet wide, adjoining shorewards the piece 96 feet long that was built last year. The outer face of the new piece of buttress was also sheathed 12 feet high with creosoted 4-inch plank, as a protection against the limnoria.

Spring tides rise 18 feet, neaps 15 feet.

Total expenditure to June 30, 1901, is \$25,205.57, including a refund of \$1,971.66 to the provincial government in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on January 22, 1885.

## RAGGED HEAD.

Ragged Pond, Guysboro' county, on the north side of Chedabucto bay, about 6 miles east of Guysboro' harbour, is a triangular sheet of water with an area of about 180 acres and a depth of from two to five fathoms. It is inclosed by shingle beaches, through which there is a narrow channel on the western side of Ragged Head.

During the years 1878-83 the channel was improved, and protection works, consisting of 110 feet crib-work and 428 feet of brush and stone work were constructed on the southern side.

In 1899-1900 the sum of \$200 was expended in repairing the inner 50 feet of the crib-work, and in improving the depth over a deposit of gravel obstructing the channel.

During the fiscal year 1900-1 the sum of \$400.36 was expended in making a cutting through a bank of sand and gravel by which the entrance had been closed, and in deepening over the shoal ground within the entrance.

The surface of the pond is 3 feet higher (at low water inside) than low water outside; consequently there is a fall at low water of 3 feet in the length of the channel (600 feet). The depth in the channel, at low water, is about 3 feet, except near the entrance where it is about 1 foot.

Spring tides rise 6 feet.

Total expenditure to June 30, 1901, is \$5,144.97.

## RIVER JOHN.

River John, Pictou county, empties into the head of John bay, on the Northumberland strait, about 24 miles to the westward of the entrance to Pictou harbour. It has about 3 feet at low water, or 11 feet at high water, over the bar at the entrance, and from 3 to 11 feet at low water in a very narrow channel up to the bridge, a distance of nearly a mile. The village is situated on each side of the river near the bridge, and about three-quarters of a mile from the station of the Oxford and Pictou branch of the Intercolonial Railway.

The sum of \$2,000 was appropriated for expenditure in 1899-1900 in connection with the construction of a wharf at River John, but of the amount appropriated the sum of \$449.94 only was expended in the purchase of the land required; the creosoted timber to be used in the construction of the wharf was ordered, but not delivered.

The proposed wharf is to consist of a pile-head 60 x 20 feet, with a crib-work retaining wall 60 x 10 feet at the back of it, and wing walls of crib-work on either side, 10 feet wide, and respectively 78 and 61 feet in length; the space inclosed by the retaining walls and the shore to be filled in with clay, covered with gravel, and a road is to be constructed between the wharf and the highway. The depth of water along the channel face at low water will be 9 feet.

Spring tides rise 8 feet.

During the fiscal year ended June 30, 1901, the sum of \$1,697.41 was expended in procuring nearly all the timber required for the construction of the wharf; in the construction of the timber retaining walls, and of the pile-head, but the former were



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not ballasted, and the pile-head still required the walings, the cap-timbers, the fender piles and the mooring piles, to complete it. The clay filling between the retaining walls and the shore was about half completed.

The total expenditure on this work up to June 30, 1901, is \$2,147.35.

#### SALMON RIVER.

A small stream, called Salmon river, Digby county, empties into the Bay of Fundy 15 miles north of Yarmouth, 30 miles south of Weymouth,  $3\frac{1}{2}$  miles north of the boundary line between the counties of Digby and Yarmouth, and  $4\frac{1}{2}$  miles north of Port Maitland, in the latter county.

The population of the settlement, within a mile either way of the river's mouth, comprises about 500 people, engaged in farming, lumbering, fishing and general trade. The imports by water are general merchandise for local consumption ; and the exports, lumber and cord-wood, with smaller quantities of farm produce and fish. The river, though not large, drains a number of large lakes, and is the most important stream in the southern part of Digby county. It empties into the Bay of Fundy through a sand and gravel bar, inside of which there is a sheltered pond, which, with the exception of the bed of the stream, is dry at low water. The pond has been formed into a small tidal harbour by the construction of two separate works, one on either side of the river's mouth.

The southern work, which is the more important, stops the gravel from interfering with the free discharge of the river, and acts as a breakwater and loading wharf for vessels.

The northern work is simply a groyne or gravel pier, built to prevent the undertow from bringing the gravel into the river mouth from the north beach, and, by confining the outflow, gives a better chance to scour.

Both these works, with the exception of certain repairs hereafter described, were built by the provincial government and private enterprise.

The first expenditure by the department was in 1874, when the sum of \$2,656.03 was spent in repairing and strengthening the works. In 1887-8 the sum of \$1,000 was spent in rebuilding portion of the river face of the southern work, which was much decayed, and undermined by the river. These repairs were begun at the western end of the private wharf property, then owned by Foley Bros. (more recently by Chas. Barril & Co., of Weymouth, and purchased from them by the department in 1899-1900), and continued westerly towards the outer end of the breakwater for a distance of 290 $\frac{1}{2}$  feet ; but the outer end of this face, for a distance of 120 feet, was left in its original condition. In 1893-4 the sum of \$500 was expended in general repairs to both works, the work being done as follows :—

Wharf or breakwater.—A block on the south face, 32 feet long and 20 feet wide, was cut down and rebuilt ; the outer end for 30 feet was raised about 18 inches, and 26 new fender piles were placed, 6 on the end and 20 along the outer face.

Gravel pier or groyne.—The inner 90 feet was practically rebuilt ; the adjoining 30 feet was covered with new cross-ties and floor-stringers, and a new 20-foot block was built on the outer end to replace the 30-foot block that had been carried away.

In the fiscal year 1899-1900 the sum of \$500 was expended in purchasing logs and timber for the purpose of building a further extension to the breakwater and in repairing the existing work on the north side of the river's mouth.

In 1900-1 the sum of \$4,723.72 was expended in important extensions, renewals and repairs. The work done consists of the construction of a widening block, 120 feet long, 11 feet wide and 14 feet high, on the northern side of the outer end of the breakwater ; next, a new block in extension of the breakwater, 60 feet long, from 27 to 37 feet wide and 15 to 18 feet high, substantially built of round-log crib-work, filled with ballast and sheathed on the seaward face with flatted spars. The new block was pro-



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vided with a break 4 feet high, on the seaward side ; this was continued shorewards on the old work, and beyond high-water mark, a distance of 200 feet. The older portion of the breakwater or river wall, for a length of 170 feet, was also thoroughly repaired. On the north side of the mouth of the river, the groyne for preventing the gravel from washing into the river's mouth was extended outwards by constructing a block 33 feet long, 21 feet wide and 15 feet high. The shoreward end of the groyne was thoroughly rebuilt for a length of 100 feet, the next 60 feet in length seawards being retopped, refendered and planked.

Spring tides rise about 18 feet, neaps 15 feet.

Total expenditure to June 30, 1901, is \$12,408.62, including a refund to the provincial government of \$329.92, in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

## SANDFORD.

Sandford, Cranberry Head, is situated on the Atlantic coast of Nova Scotia, at the extreme western point of Yarmouth county, 7 miles north-west from the town of Yarmouth. The settlement in the neighbourhood, which has for some years been known as Sandford, has a population of from 300 to 400 people, engaged in fishing and farming.

In 1858 a breakwater was begun by the inhabitants aided by the provincial government. In 1876 the sum of \$2,000 was expended by the department in extending the work 150 feet. In 1878-9 the sum of \$1,000.08 was spent in constructing an additional length of 50 feet, and in repairing the older portions. In 1880 the sum of \$499.95 was expended in repairing the damage done by a storm in August, 1879. In 1883-4 \$100 was expended on resheathing the outer end, and in effecting other needed repairs. In 1885-6 some slight repairs were made to the seaward face of the breakwater at a cost of \$109. In 1887-8 miscellaneous repairs were made at a cost of \$768.74. In February, 1892, two serious breaches were made in the work by heavy gales, and a quantity of gravel was driven through into the little boat harbour inside. If repairs had been made without delay, the work could probably have been saved, but nothing was done, and in the next two or three years about 300 feet, *i.e.*, the whole work except the outer block, was destroyed, the remaining piece being 60 feet long, 22 feet wide, and from 18 to 20 feet high. Before this date six or seven fishing schooners of 10 to 20 tons each, besides a number of smaller boats were owned in the place, and considerable fishing business was done. Since the destruction of the breakwater, and owing to the consequent lack of shelter, the schooners and most of the boats were disposed of, and the fishing industry in the locality practically ceased.

In 1898-9 the sum of \$3,497.25 was expended in partially rebuilding the shoreward portion of the work on a new site rendered necessary by the altered configuration of the beach; the remaining outer block was also thoroughly repaired. The new work, of which a length of 200 feet was built during the year, starts at the shore at a point about 350 feet eastward of the point where the former work began, and it was built in a north-westerly direction towards the outer block of the old work, with which it was connected. Besides the portion of new breakwater built during the year, a small boat channel, about 40 feet long and 8 feet deep, was excavated through the beach under lee of the breakwater to give access to the salt water pond which forms a valuable shelter for fishing boats during heavy gales in the winter season.

In 1899-1900 the sum of \$2,599.96 was expended in completing the rebuilding of the breakwater begun last year. The portion of the work built being 81 feet long and 26 feet wide, with an average height of about 12 feet. A piece of beach protection work, 240 feet long, 10 feet wide, and from 6 to 8 feet high was also built in a westerly direction from the shore end of the breakwater to prevent the seas from driving the gravel beach into the little pond which shelters the boats of the fishing fleet.



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In 1900-1 the sum of \$149.92 was expended in replacing the ballast that was washed by the heavy storm in October, 1900, out of the beach protection work adjoining the breakwater on its west side, and to prevent a recurrence of the damage it was covered with poles.

Total expenditure to June 30, 1901, is \$29,255.88, including a refund of \$11,632 to the provincial government in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

#### SAULNIERVILLE.

Saulnierville, Digby county, with a population of about 250, is situated on the south-east coast of St. Mary's bay, Bay of Fundy, 36 miles south-west of Digby, 32 miles north of Yarmouth, and 3 miles north of Meteghan river.

Some years before confederation, a breakwater, serving also as a landing wharf, was built by the inhabitants aided by the provincial government, at a cost of \$2,000. In 1876 the sum of \$4,000, of which half was contributed by the department and half by the inhabitants, was expended in making thorough repairs to the work and in extending it a length of 100 feet. In 1888-9 further extensive repairs were made at a cost of nearly \$2,000. In 1899-1900 damage done by a severe storm in 1900 was made good at a cost of about \$400.

In 1900-1 the sum of \$1,999.49 was expended in repairs and extensions. The repairs, which were to make good damage done by the great storm and tide of March 1, 1900, consist of the renewal of the outer 60 feet in length of the floor of the breakwater, with new planking, guards and stringers, which had been broken and displaced by the waves. The work was extended a length of 37 feet, is substantially built of round-log crib-work of the usual type, close-sheathed on the seaward side and outer end; it is 33 feet wide and from 20 to 24 feet high. The shoreward end of the old work was also repaired for a length of about 70 feet, the repairs being necessitated by damage done by the severe gale of November 9 and 10, 1900. The breakwater has now a total length of 505 feet. At the outer end at H.W.O.S.T. there is a depth of about 14 feet of water.

Spring tides rise 21 feet, neaps 18 feet. At low water the sand flats are bare for several hundred feet beyond the end of the work.

Total expenditure to June 30, 1901, is \$8,203.14, including a refund of \$1,926.53 to the provincial government in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.

#### SCOTT'S BAY.

Scott's Bay, King's county, is on the south side of Minas channel, Bay of Fundy, between Cape Split and Baxter's harbour. The population of the settlement within a radius of a couple of miles is about 500.

In 1878-9, the department built a block of crib-work 50 feet long, 30 feet wide and about 20 feet high, connected with the shore by a double row of close-piling 210 feet long from the south-east corner of the block; the crib-work was built of close-faced work, well fendered and ballasted. The work was located on the west side of Jess creek, and formed a harbour or shelter for vessels during south-west storms.

As it had no floor much of the ballast has been removed, presumably for ballasting schooners. Both the block and the close-piling are more or less dilapidated, 40 feet in length of the close-piling being totally destroyed. The expenditure on this block and the close-pile work by the department between 1867 and 1882 was \$3,000.

In 1900-1, the department expended \$500 in building two blocks of crib-work, one on either side of the mouth of the creek. The northern block is 115 feet long, 10 feet wide and from 6 to 8 feet high. Both blocks are of round-log stone-filled crib-work.



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Their object is to prevent the gravel and sand from washing into the mouth of the creek, which the old work had become inadequate to protect.

Spring tides rise 36 feet, neaps 32 feet.

Total expenditure to June 30, 1901, is \$4,000.

## SHAG HARBOUR.

Shag harbour, Shelburne county, is a scattered village of about 600 inhabitants situated about 6 miles north-west of Barrington, and about 45 miles south-east of Yarmouth town.

During the fiscal year 1899-1900, the department began the construction of a pile trestle bent wharf. This work as constructed consists of a rock bank 53 feet long, 25 feet wide on top and a height at the outer end of 10 feet. Adjoining this is the wharf proper 221 feet long, 20 feet wide with an 'L' or return 20 by 20 ; it is constructed of pile trestle bents placed 10 feet apart measured from the centre. This work was not finished and is still incomplete as the sum of \$250 appropriated has lapsed owing to the scarcity of labour.

Spring tides rise 10 feet, neaps 7.

Total expenditure to June 30, 1901, is \$1,950.93.

## SIGHT POINT.

Sight Point, Inverness county, is on the west coast of Cape Breton island, 7 miles to the southward of the entrance to Mabou harbour.

The amount appropriated for expenditure in 1900-1, \$500, was expended in May and June in constructing a crib-work block 24 feet in length and 17 feet in width, on top, in from  $2\frac{1}{2}$  to 4 feet at low water—to form part of a small breakwater to shelter a landing place for boats—and in procuring some of the material required for an extension outwards 22 feet in length.

Spring tides rise 4 feet.

## SOMERVILLE.

Somerville, Queen's county, is a small fishing and farming settlement of about 250 people, situate on the Atlantic coast, 8 miles south-west of Liverpool, the county town.

In 1879 the department built a breakwater for the accommodation and shelter of fishing vessels. The work was about 200 feet long, 20 feet wide on top and 16 feet high at the outer end. In 1882 a slight expenditure was made in repairing damage caused by southerly storms. Early in 1892 about 100 feet, nearly half the length of the outer work, was destroyed by a violent gale, and in the autumn of the same year the sum of \$640 was expended in necessary repairs. The work done consisted of rebuilding 30 feet in length of new work and in renewing portions of the floor and sheathing of the old work. The breakwater was then 130 feet long, 20 feet wide on top and 12 feet high at the outer end. The seaward face sloped one to one from the floor to about low-water mark, and was close-sheathed with 6-inch plank. The whole work was built of square timber, close-faced crib-work. As this work is situate on one of the most exposed portions of the Atlantic coast, and as the limnoria also frequent the waters in this vicinity, it could not possibly stand for many years. In consequence, in the winter of 1899, a heavy storm completely destroyed the breakwater.

During the present year, 1900-1, it was decided to construct a more permanent work on a site immediately contiguous to the old site, and the work consists of an approach and a main structure. The approach is 58 feet long, 12 feet wide on top and 6 feet high at the outer end. The main structure is 90 feet long, 24 feet wide on top



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and 33 feet on the bottom, with a height at the outer end of 16 feet. The style of structure erected consists of large stones, cemented together and securely fastened to each other by large iron dogs. Holes were first drilled in the rock to a depth of 6 inches, and after the iron had been placed in them, these holes were filled with Portland cement concrete.

The workmanship is good and substantial, and the only question which may arise in future in connection with this work is its possible extension.

The expenditure during the fiscal year was \$2,435.14.

Total expenditure to June 30, 1901, \$6,743.78.

#### THREE FATHOM HARBOUR.

Three Fathom harbour, Halifax county, is situate on the Atlantic coast, about 15 miles east of Halifax harbour. It is formed by connecting gravel beaches, and though small, is sheltered from all quarters. It is the rendezvous of a large number of fishermen, principally inhabitants of the surrounding country, and during the fishing season is a busy place.

For the purpose of preventing the sea from breaking through the narrow shingle beach which separates the harbour from the Atlantic, the department in 1878 constructed a crib-work along the crown of the beach. In 1889 the work was extended and repaired; the total length then was 1,050 feet, from 4 to 8 feet in height, with a width on top of 13 feet. It is built throughout of round-log crib-work, thoroughly fendered and filled with ballast. During the fiscal year 1900-1 the sum of \$595.37 was expended in repairing this work; it not only needed repairs, but it required to be extended in order to protect the beach and the property in the vicinity. The sheathing was broken apart, the top work was decayed and destroyed, and the ballast had spilled out in many places; additional damage occurred during the past winter. The work done consisted of repairing 100 feet in length, 6 feet wide and 4 feet high, besides extending the work 35 feet in length, with a width of 8 feet on top and a height of from 8 to 10 feet.

Total expenditure to June 30, 1901, is \$6,117.62.

#### TROUT COVE.

Trout Cove, Digby county, is a small indentation about 1,000 feet long and 600 feet deep, on the Bay of Fundy, coast of Digby neck. It is about midway, and has the only breakwater affording shelter to fishing boats between Digby gut and Petit passage, being 18 miles south-east from the former. The settlement at and near the cove, which is called Centreville, has a population of about 300 people engaged in fishing and farming. The fishing fleet comprises 25 to 30 boats of 16 to 18 feet keel, and there are also owned here two schooners of about 30 tons each, which during the season run to and from St. John, Halifax, Yarmouth and Lunenburg, with produce, fish, lumber, flour, &c. There is a factory for the canning of finnan haddies and kippered herring, which is doing a large business. Within a short distance of the cove is excellent fishing ground for cod, haddock, hake, lobsters, &c.

A breakwater was begun in 1856 by the inhabitants aided by the provincial government; the work as then built being 200 feet long and 30 feet wide. In 1876 it was extended by the department a distance of 178 feet. In 1880 extensive repairs were made to the old portion of the breakwater, of which 100 feet had been destroyed in 1879; in 1882-3 general repairs were made; in 1885-6 \$1,000 was spent in repairing the inner portion, which was much weakened by heavy seas; 100 feet of new facing was built, the break renewed and strengthened, and some ballast placed in the outer end of the work. In 1887-8 140 feet of the inner portion of the seaward face was rebuilt from the beach to the top of the break; part of the flooring was renewed, and other necessary



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repairs carried out. In 1888-9 the sum of \$399.79 was expended in repairing the inner end of the work, the beach having washed away and exposed the foundations.

In 1886 the inhabitants built a small block of crib-work 24 feet long, 15 feet wide, and 9 feet high at the shoreward end of the north side of the breakwater for the purpose of protecting it and the adjoining bank, on which is situated a large fish-house and store. In 1891-2 the outer end of the breakwater was repaired. In 1894-5 the sum of \$81.50 was expended in repairing a small block of crib-work on the north end of the north side of the work, and in placing about 100 tons of ballast in the shore end of the breakwater to replace that washed out by the heavy winter storms. In 1896-7 the sum of \$3,990.02 was expended in thorough repairs and renewals; 130 feet in length of the inner side of the shore end was taken down and rebuilt with new timber; 80 feet in length of the seaward side of the outer end was close-fendered, and the whole work was refloored. The middle 100 feet in length was also raised 2 feet in height so as to make up for settlement. The shoreward half of the inner face was close-sheathed to prevent the brook from undermining the work, and the outer face was re-enforced and new fendered.

On April 12, 1898, a contract was awarded for the extension of the breakwater 100 feet. The work, which is thoroughly well and substantially built, was not finished until September, 1899. The work is now 474 feet long on the north side. It is 30 feet wide on top and at the outer end 25 feet high, where there is 23 feet of water at H.W.O.S.T. In 1898-9 the sum of \$41.12 was expended in protecting with crib-work and stone the shoreward end of the breakwater, which had been slightly damaged by a storm in the middle of January. In the fiscal year 1899-1900 the sum of \$700 was expended in building a block of crib-work 56 feet long, 16 feet and 13 feet high for the protection of the shoreward end of the breakwater.

In 1900-1 the sum of \$1,200 was expended in rebuilding a portion of the shoreward end and east side of the breakwater, 66 feet long, 15 feet wide, and from 12 to 15 feet high, which was old, much decayed and threatening to fall.

Total expenditure to June 30, 1901, is \$20,091.24, including refund of \$685 to the provincial government in 1887-8.

This work was transferred to the control of Department of Marine and Fisheries on June 12, 1888.

## VICTORIA.

Victoria harbour, King's county, is situated at the mouth of Church Vault brook, on the south shore of the Bay of Fundy, 52 miles north-west of Digby Gut, and half way between Morden and Ogilvie's wharf, from each of which it is distant about 4 miles.

The breakwater, which also serves as a landing and loading pier, was begun in 1864, and finished in 1867 at the joint expense of the inhabitants and the provincial government. It is 242 feet long, 27½ feet wide at its outer end, 23 feet wide at its inner end and 24 feet in height at its outer end.

In 1878 the work was repaired and raised 4 feet. Slight repairs were made in 1891 and in 1893.

In 1900-1, the sum of \$398.81 was expended in renewing 88 feet in length of the crib-breastwork, forming the eastern side of the road approach. The new work is from 6 to 10 feet high, from 10 to 15 feet wide, strongly built of round-log crib-work, well fendered and full ballasted. A portion of the flooring of the shore end of the breakwater was also renewed.

Spring tides rise 36 feet.

Total expenditure to June 30, 1901, is \$2,023.79, including a refund to the provincial government of \$450 in 1887-8.

This work was transferred to control of Department of Marine and Fisheries on June 12, 1888.



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## WALTON.

Walton harbour, Hants county, is the mouth of La Tete river and is situated on the south shore of the basin of Minas, Bay of Fundy, about 14 miles north-east of Cheverie at the mouth of the Avon river. The village of Walton, which is situated at the head of the harbour on its north-east side, has a population of 500. The most important industry of the place is the shipment of gypsum, of which from 5,000 to 10,000 tons are annually shipped to the United States.

For the protection of the harbour a breakwater was built by the department in 1891, at a cost by contract of \$6,170. The work is 250 feet long, 28 feet high at the outer end, and 22 feet wide on top. It is substantially built of round-log crib-work of the usual type, well fendered and filled with ballast. The inner face has a batter of one in eight, and the outer side one in two. The outer face, the end, and the inner face for a distance of 100 feet, are close-sheathed. On the seaward side is a break 4 feet high, built of 12-inch timbers, strongly braced by knees, spaced 10 feet apart.

At the outer end of the work is a depth of 24 feet of water at high tide.

In 1900-1, necessary repairs were made consisting of new floor with stringers and guard timbers, a few new top cross-logs, new break timbers and seven new knees.

Spring tides rise 48 feet, neaps 40 feet.

Total expenditure to June 30, 1901, is \$7,375.71.

## WEST CHEZZETCOOK.

West Chezzetcook, Halifax county, is situated on the western side of Chezzetcook inlet, which lies about 16 miles east of Halifax harbour. The inlet is from a half to three-quarters of a mile wide at the mouth, extends five miles inland and receives the waters of several small lakes at its head. The population of this village is from seven hundred to a thousand, located in a scattering manner along the west shores of the inlet. The chief pursuits of these people consist of fishing, farming and some lumbering. The inlet itself, which has an average width of about one mile, is shallow with a bottom of sand and mud so that at low water there are quite extensive flats laid bare. There is, however, a narrow tortuous channel running to the extreme head of the inlet with a depth of from 6 to 8 feet at L.W.O.S.T. which is used by numerous fishing schooners, coasting schooners and many small craft such as three and four hand fishing boats and skiffs.

Owing to the gradual filling up of the entrance to the channel with accumulations of sand, a breakwater or mole was constructed by this department in 1892 at a cost by contract of \$11,160.97. This work was designed to create scour to deepen and improve the navigation of the entrance to the channel. It is built in a westerly direction from the foot of the southern end of Conrod's island which forms the western side of the west channel entering the inlet. At this point the channel from high water to high water was 1,500 feet wide, therefore from the end of the breakwater to high water it is now only 600 feet. This great contraction of the channel had the effect of creating a strong current at ebb and flood tide and the fine sand at the work was scouring to such an extent as to cause the whole length of the 'L' to settle from 4 to 6 feet and the stem of the work, or the seaward 900 feet, from two to four feet; this scouring necessitated the placing of a substantial toe of brush and stone along both sides of the whole work.

The breakwater has a length of 1,100 feet, of which 900 feet is at right angles to the channel and the remaining 200 feet or 'L' parallel to it. At the southern end of the 'L' is a square block 30 feet by 30 which is close-faced with vertical sheathing five inches thick. The rest of the work was ordinary stone-filled open crib-work with sides battering one in five and a top width of 15 feet.

In the spring of 1895, severe storms damaged 363 feet of the top of the work. In September of the same year \$500 was expended in rebuilding this work; five logs in



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height for a length of 363 feet were taken apart and rebuilt. In the fall of 1897 similar damage was done, showing that the work is located in the wrong place and that the seaward side should have been close-piled or sheathed in order to protect it. In the summer and fall of 1898 the sum of \$999 was expended in reconstructing a length of 235 feet of the breakwater from two to four logs high, whilst a length of 288 feet was sheathed. This was not sufficient, for in January, 1900, the part not sheathed was lifted and partly destroyed over a length of 175 feet. The sum of \$300 was expended during the fiscal year 1900 in partially repairing this damage.

During the last fiscal year these repairs were completed at a cost of \$496.59. The work now is thoroughly sheathed and the covering entirely renewed. Besides this the outside of the breakwater has been rip-rapped with a toe of stone and brush in order to catch the drift sand. This stone and brush has effectually accomplished its purpose and the sand which had accumulated to a large extent will prove a grand protection to the main portion of the breakwater.

The breakwater has been well ballasted, whilst the timber used in sheathing and covering is all hand hewn and of the best quality of spruce and hemlock.

Total expenditure to June 30, 1901, is \$14,286.09.

## WESTERN HEAD.

Western Head is one of the most important shore-fishing stations in Queen's county. It is situate on the south side of Liverpool bay, about 4 miles to the south of the county town of Liverpool. Projecting from the head is a broken rocky ridge which forms a partial shelter and enables fishermen to land in their boats in moderate weather; but the difficulty always was that the fishermen were not only unable to launch their boats in rough weather, but there was much danger in effecting a landing when they had been caught on the fishing grounds in sudden storms.

In 1887 the department began the construction of a stone breakwater to give this desired protection, and work was proceeded with during the fiscal year 1887-8 and continued in the following year. The breakwater was built immediately behind and partly in shelter of the rocky ledge, and was constructed entirely of large stone quarried for the purpose; the portion of the work from low-water mark upwards being built of selected stone, hand-placed and firmly bolted together. The whole work was 190 feet long and 40 feet wide on top. Soon after the breakwater was completed, the coast was visited by an unusually heavy storm, which lasted three days and destroyed 100 feet of the outer end of the work.

In 1889-90 the sum of \$5,000 was expended in repairing and rebuilding the work. Owing to the depth of water inside the reef and the difficulty in securing a foundation, it was decided to rebuild on the top of the reef, all of which could be reached at low water. The projecting points of the reef were cut away and a bed prepared for the foundation course, which was built down to bed rock, and the interstices between the stones filled in with Portland cement concrete. Each succeeding course was laid in a similar manner, the top of the breakwater being carried up 5 feet above high water, and the surface finished smooth. Where the new work and the old join, the breakwater is 40 feet wide, reduced in width to 29 feet where it joins the reef. The total amount of work built during that year was 106 feet. In 1898-9 the sum of \$954.29 was expended in repairing this work, as the constant action of the waves had greatly weakened the structure. The work done consisted of practically rebuilding a portion of the breakwater 90 feet in length, 29 feet in width, for an average height of 8 feet, besides material repairs to other portions of the work.

In September, 1900, this work was slightly damaged, but was repaired during the fiscal year at a cost of \$22.05.

Total expenditure to June 30, 1901, was \$13,012.80.



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## WEST PUBNICO.

Pubnico harbour, Yarmouth county, is situated some 30 miles south-west of Yarmouth ; it is about 8 miles long from mouth to head, lying due north and south, and from three-quarters to a mile and a half wide.

On the west side of the harbour and about 3 miles above its mouth, a wharf was built by the department in 1885-6 to 1886-7. The work consists of a stone and gravel causeway, 285 feet long, followed by a wharf 230 feet long, of pile bents. The bank is 25 feet wide, an average height of 4 to 5 feet ; the wharf is of the same width and from 10 to 14 feet high. At L.W.O.S.T. the mud flats are bare for over 1,000 feet beyond the end of the wharf.

In 1900-1 the sum of \$2,025 was expended in repairs and extensions, the work done being as follows :—

(a.) The raising and regravelling of the stone approach, 290 feet in length ; many of the top stones, which had been displaced, were renewed, and from 6 inches to 18 inches of fresh gravel was laid.

(b.) The thorough repair of the older portion of the work, comprising new fender piles, guard timbers and transverse bracing. The whole of the floor was taken up and relaid, about one-half of it in new plank.

(c.) The construction of an extension 167 feet long of equal width and similar construction with the old work, viz.: 25 feet wide and of pile bents. The outer end of the work, which is all of pile-work, is now 15 feet high, carrying a depth of water of about 12 feet at H.W.O.S.T.

(d.) The placing of three dolphins, consisting of 4 piles each, from 500 to 1,200 feet distant from the wharf to mark the positions of rocky ledges. The piles forming each dolphin are strongly chained and bolted together at the top, and painted.

The total length of the pile-work is now 397 feet.

Spring tides rise 12 feet, neaps 10 feet.

Total expenditure to June 30, 1901, is \$4,273.63.

## WHITE HAVEN.

White Haven, Guysboro' county, one of the finest harbours in Nova Scotia, is on the south or Atlantic coast, 14 miles to the westward of Cape Canso.

In 1854 the residents, with some aid from the provincial government, undertook the construction of a canal for boats, through a low and narrow isthmus between Marshall cove, 3 miles within the entrance, and Witch cove at the eastern extremity of Torbay. On the completion of improvements made in 1876, it was 620 feet in length, and from 10 to 12 feet in width, the bottom was about 1 foot above extreme low water, or 4 feet 6 inches below the level of extreme high water. Prior to 1884 the walls had fallen into a dilapidated condition, and the southern entrance had become blocked with sand, and the channel inside filled in with sediment and washing from the slope.

In 1894-5 repairs and improvements were made by the department with the object of obtaining, ultimately, a uniform depth at extreme low water of 1 foot, and a width, between retaining walls, of 12 feet. The repairs and improvements effected included the removal of 160 feet of old retaining wall on each side at the south end, and the construction of walls 10 feet wide on top, of which 20 feet at the outer end on each side are of crib-work, and the remaining 140 feet of brush and stone; temporary repairs to the retaining wall on both sides from 160 to 270 feet from the south end and on the east side from 328 to 480 feet from the south end ; the construction of new walls on either side from 480 to 500 feet from the south end as foundations for bridge abutment built by the municipality ; the reconstruction of 100 feet of wall on the west side (500 to 600 feet from the south end) ; the construction of 141 feet of temporary wall on either side (600 to 741 feet from the south end) ; and deepening from end to end to within from 3 to 6 inches of extreme low water.



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During the fiscal year, 1900-1, the sum of \$1,686.86 was expended in continuing the improvements undertaken in 1894-5. The work performed included the construction of 137 feet of brush and stone retaining wall on either side (160 to 297 feet from the south end); the removal of old wall on the west side, and the completion, with the exception of the upper course, or new stone retaining walls on either side from 297 to 480 feet from the south end; the removal of old and the construction of new stone retaining wall on the west side from 500 to 565 feet from the south end; the construction of 95 feet of stone retaining wall on the east side (500 to 595 feet from the south end); and some rock excavation over the bottom from 297 to 480 feet from the south end.

The total expenditure to June 30, 1901, including refund of \$836.42 to the provincial government is \$4,018.31.

## WINDSOR.

Windsor, the county town of Hants, with a population of about 4,500, is an important town situated at head of the estuary of the River Avon, on the Dominion Atlantic Railway, 46 miles north-west from Halifax. The shipping registered at the port for the year ending 1896, amounted to about 131,000 tons. In the neighbourhood are extensive quarries of gypsum, of which about 120,000 tons are annually shipped to the United States. Some two or three million feet of lumber B.M. are also annually exported by water. Up to a dozen years ago the wharfs of the town were comparatively free from mud, and at high water large vessels could lie alongside and load or discharge. In the last few years, owing partly no doubt to the construction of the new highway bridge, the mud has accumulated in front of the wharfs to such an extent that it is only at extreme high tide that moderate sized vessels can approach or leave the wharfs.

With the object of scouring away the accumulated mud, the department in 1897-8 began the construction of a training weir, extending down stream from the corner of the Falmouth abutment of the road bridge at an angle of 45 degrees with the bridge. The weir is constructed of brush mattresses at the bottom, with sufficient stone to keep them in place, and with crib-work on top of them. The thickness of the brush mattresses, with their load of stone, is from 2 to 4 feet, the average depth of the main or under crib is from 5 to 8 feet, and the uniform height of the 'A' shaped top crib is 7 feet; the sloping sides of the top of the work are sheathed with 3-inch hardwood plank, and the crest is covered with 6 x 6 x  $\frac{3}{4}$ -inch steel angle securely bolted. The work is built on shifting quicksands, and owing to the great rise and fall of the tide (about 40 feet) and the great velocity of the current at ebb and flood tide, it has been constructed under great and peculiar difficulties.

In the fiscal year, ending June 30, 1901, the work was completed to its originally designed length of 600 feet.

There is no doubt but that the training weir is having a beneficial effect in causing the ebb tide to concentrate on the Windsor side and scour away the mud from the wharfs, but its operation is much slower than was expected, and it appears evident that a still further extension of not less than 100 feet will be necessary before it will have the desired efficiency.

Spring tides rise about 40 feet, neaps 36 feet.

Total expenditure to June 30, 1901, is \$14,164.53, and \$1,627.60 for dredging.

## WOLFVILLE.

Wolfville, King's county, is a town of about 2,000 people, situated on the right bank, and near the mouth, of the Cornwallis river, which issues into the basin of Minas at its south-west corner. It is an important station on the Dominion Atlantic Railway, half way between Annapolis and Halifax, 64 miles from Halifax, 66 from Annapolis, and 7 miles east of Kentville, the county town of King's.



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In 1900-1 (contract dated May 12, 1900, work finished in December, 1900), the department built a public wharf on the right bank of the river, near its mouth, at a distance of about half a mile from the town. The approach consists of earthwork—an embankment 144 feet in length, 26 feet wide and of an average height of 5 feet. The wharf itself, which is substantially built of pile work, is 152 feet long, 36 feet wide, including an inclined slope on the south side 10 feet wide. It has an 'L' on the outer end 82 feet long, giving a total face length on the river channel of 116 feet; the 'L' is 40 feet wide, and is from 48 to 49½ feet in height along the face, giving a depth of water at H.W.O.S.T. of about 46 feet. At L.W.O.S.T. the river channel carries a depth of 4 to 6 feet of mostly fresh water.

Spring tides rise 48 feet, neaps 40 feet.

The wharf was built by contract at a total cost of \$6,360.50, and is in excellent condition.

#### YARMOUTH BAR.

Yarmouth, the county town of Yarmouth county, is situated at the south-western extremity of Nova Scotia. It is a thriving and prosperous town of nearly 7,000 inhabitants, and, next to Halifax, the largest and most important in Nova Scotia. It is the terminus of the Dominion Atlantic Railway, whose fine Clyde-built steamers make regular trips throughout the year to Boston. There are several important manufacturing in the place, but the leading business is shipping, of which a larger tonnage is owned here than in almost any other locality in Canada.

At low water, Yarmouth harbour, in which spring tides rise 16, neaps 13 feet, consists largely of mud flats covered with grass. The harbour is formed by a succession of shingle or gravel beaches (called Stanwood beach), aggregating about one mile in length, which connect the northern end of Cape Fouchu island, also about a mile long, with the southern end of Stony point, on the mainland, and separate the harbour from the Bay of Fundy.

In 1867 it was found that part of the beach between Cape Fouchu and Stony Point was gradually wearing down, and unless this action was arrested, the sea would eventually sweep away the beach and destroy the harbour. The government of Nova Scotia began the work of protecting the beach in 1867, by constructing 200 feet of crib-work at Stony Point. Between 1873 and 1875 the Public Works Department constructed the remaining 2,800 feet of protection work required to reach Cape Fouchu, and added buttresses or groynes to stop the movement of the gravel.

Between 1875 and 1888 the protection works, although substantially built of stone-filled crib-work and close-piles on their seaward faces, had to be repaired and strengthened, the expense amounting to over \$25,000.

Between 1888 and 1896 no further works of repair were undertaken on the beach protection, which became dilapidated and decayed. Breaches were made through it by the sea at various places. During the fiscal year 1896-7 the sum of \$2,983.62 was expended in carrying on the most urgent works of repair, and in 1897-8 a further sum of \$3,234.51 was expended in continuing and completing these repairs. This last sum was applied in rebuilding a length of 50 feet at the eastern end of the protection work, and in constructing a groyne, projecting at right angles from the same end, for a distance of 175 feet. The groyne is 25 feet wide and 11 feet high, substantially built of round-log, stone-filled crib-work. Its object was to protect the beach at the north-eastern end of the main crib-work protection by accumulating the gravel and breaking up the waves before they expended their force on the beach. It has admirably fulfilled its purpose, as gravel has accumulated at the junction of the groyne with the main work to a depth of over 14 feet.

In 1898-9 the sum of \$300 was expended in repairing a small but serious breach, 25 feet long in the bottom of the outer face of the beach protection work, and in covering with 3-inch hemlock plank a length of 430 feet of the top of the work, in order to



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prevent the ballast from being washed out by the waves. In 1899-1900 the sum of \$970.27 was expended in repairing two or three small but dangerous breaches in the seaward face of the work, and in covering the top for a length of about 670 feet with 3-inch plank to prevent the sea from washing out ballast.

In 1900-1 the sum of \$3,389.70 was expended in extensions and repairs, the individual expenditures and the work done being as follows:—

(a.) \$142.43 was expended in repairing and filling with ballast a length of 60 feet of the older portion of the work.

(b.) \$2,798.50 in extending the work 514 feet westerly; this new length is 8 feet wide, from 5 to 8 feet high, substantially built of round-log crib-work, sheathed on the seaward face, and covered on top with round spars well spiked on.

(c.) \$448.77 in rebuilding a length of 50 feet of the older portion of the work near its eastern end, which was severely damaged by a heavy sea on November 9-10, 1900.

Spring tides rise about 15 feet, neaps 12 feet.

Total expenditure to June 30, 1901, is \$117,476.88, including a refund of \$1,311.95 to the provincial government in 1887-8.

## PRINCE EDWARD ISLAND PIERS.

## ANNANDALE.

Annandale Pier, King's county, is situated on the north side of Grand river, near its entrance into Boughton bay, and is one of the Prince Edward Island piers, control of which was assumed in 1884 by the Dominion government.

It consists of a shore approach, or abutment, 300 feet long, 22 feet wide, and a pier head 35 feet wide, having a frontage of 140 feet on the channel, where a depth of 7 feet at low water or of 12 feet at H.W. spring tides is carried. The approach, excepting a short span of 18 feet, is constructed of close-faced timber work, filled in with brush, stone and clay which forms the roadway, while the pier head is built partly of crib-work and partly of pile bents, capped, floor stringered and planked over.

This pier, when assumed by the department, being a very old structure and much out of repair, besides being exposed to the attack of the 'teredo,' expenditure has been required almost yearly to keep it passable for traffic. Latterly it had become so unsafe that most of the pier head, particularly the parts carried on the pile bents, could not be used without danger.

During the fiscal year the pier head was reconstructed over a length of 110 feet, bearing and fender piles being put in and 37 M.B.M. timber used for capping, floor stringers and covering at a cost of \$1,250.61. The work is now in a passable condition for traffic.

Total expenditure to June 30, 1901, is \$5,486.68.

This pier was transferred to control of Department of Marine and Fisheries, August 24, 1888.

## BAY VIEW.

Bay View Pier, Queen's county, is situated on the eastern side of and near the mouth of the Hope river, that enters New London harbour, about  $3\frac{1}{2}$  miles south-east from the harbour's entrance.

The pier has in all a length of 509 feet, 409 feet from the shore outwards being 20 feet in width, this increasing gradually to a width of 35 feet at the outer end. The work is not exposed to any heavy sea, but on the occurrence of a storm with an extremely high tide, the work being too low, damage is usually done to the roadway, this happened



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during the fall of 1889 when all of the top was severely injured and the pier rendered useless for traffic.

For its repair and to raise the work two feet, a contract was entered into November, 1900, for the sum of \$694, and all of the work was on June 12, 1901, satisfactorily completed.

The expenditure during the year was \$500.

Total expenditure to June 30, 1901, \$3,489.06.

This work was transferred to control of Department of Marine and Fisheries on August 25, 1885.

#### CAMPBELL'S COVE.

Campbell's Cove, King's county, is situated on the south side of the island, about 9 miles from East Point, and 14 miles by road from Souris, the eastern terminus of the Prince Edward Island Railway.

The place was selected by the provincial government in 1872 for the construction of a small isolated breakwater 300 feet long, 70 feet from the shore, which was built on the reef extending from the west side of the cove, much benefit was received from the work, both by the fishing and farming industries of the district, and a shelter was afforded for fishing boats overtaken by storms when in the vicinity. In 1882-3, when repair of the work became necessary, it was thoroughly done by the department, and the work was connected with the shore; an extension of 250 feet was added seaward, making the breakwater in all 620 feet long, giving a small area of shelter carrying 4 feet at low water or 8 feet at H.W. springs, that rise at this place 4 feet. The repairs and additions made by the department being of a most substantial nature, the work notwithstanding its exposed situation continued in good condition up to 1889 when some slight repairs to the planking and fenders were found necessary; after that date, however, principally due to the face timbers becoming weakened by the action of the 'teredo,' the work suffered injury on the occurrence of any heavy storm, and, although extensive repairs were effected in 1885, damage was done by each succeeding storm until by 1899 when the length of 80 feet of the original work, built by the province to require reconstruction, while what outer work remained needed ballasting, &c. to require reconstruction, while what outer work remained needed ballasting, &c.

Repairs and reconstruction were effected by the close of the fiscal year, in addition to which two cribs respectively 50 and 41 feet in length, by 30 feet in width and about 4 feet high, to form a bottom for the reconstruction of the outer part of the breakwater, that had been destroyed in winter of 1893, were placed in position and securely ballasted, the expenditure on all being \$4,878.22.

Total expenditure to June 30, 1901, is \$20,668.11.

This work was transferred to control of Department of Marine and Fisheries on August 24, 1888.

#### CANOE COVE.

Canoe Cove, Queen's county, is situated on the south side of the island and north coast of Northumberland strait, and is, by water about 18 miles distant from Charlottetown, and about 10 miles east from Crapaud, it is a small indentation in the general coast line giving fairly good shelter for boats from winds from the south-east to west, being protected from north winds by a reef extending from the point on its west side.

To provide better protection at the place, some years ago the construction of a breakwater was proposed, plan and specification for which were prepared, intending having the work done under contract, but although exhibited twice none of the tenders received were accepted, it being decided to do the work by day labour, but nothing was done until the middle of April, when a crib, 32 by 50 feet in length was commenced; this and another of same size to form the bottom part of the inner end of the proposed



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structure were placed in position by the middle of June, and had by the 29th of that month been built to an average height of 7 feet forming an isolated block, commencing at 500 feet from the eastern point which forms the cove and whereon the length of work now proposed (400 feet) an average depth of 4 feet at low water, or 12 feet at high water spring tides, that rise here 8 feet, will be carried. Up to the end of the fiscal year, 1900-1, the expenditure in connection with the work for labour and materials is \$2,804.45.

## CAPE TRAVERSE.

Cape Traverse, Prince county, is situated on the south side of the island, about 14 miles east of the entrance to Summerside harbour.

The wharf has a length of 1,770 feet, 24 feet in width and averaging 13 feet in height, was commenced by the local government in 1869, when the inner 1,470 feet was built; during 1884-5 while constructing the Cape Traverse branch, the Department of Railways and Canals assumed its control, putting it in good repair and extending it seaward for a further length of 300 feet, also placing on all of its exposed face a stone protection slope, while on the wharf a freight house was built, tracks laid, &c., during the last few years the tracks and freight house have been removed, and the wharf practically abandoned by the Railway Department, this is no doubt on account of the shoal water carried at the wharf, which is not more than one or two feet at low water, although in 1892-3 a channel carrying 12 feet at low water springs was dredged to it and along its inner or protected side, but which is said to have filled up in one season. The wharf is much used during the fishing season, and some freighting is done from it in small vessels.

During the past season an expenditure of \$445.80 was made for repair of the roadway, the inner section of the wharf was made up with brush, stone and gravel, and the outer part replanked and otherwise repaired so as to render it passable for traffic.

Total expenditure to June 30, 1901, is \$16,576.84.

## CHAPEL PIER.

Chapel pier, King's county, is situated on the south side of the Grand river, about 3 miles from its entrance into Boughton bay, and about 9 miles by road from Cardigan station on the line of the Prince Edward Island Railway.

The pier was constructed by the Prince Edward Island government previous to confederation, its control being assumed by the Dominion government in 1881, it consists of shore abutment 205 feet long, and two blocks with intervening spans, in all of 88 feet, making the total length of the pier 293 feet long, 22 feet wide, and extending out to a depth of 9 feet at low water, or of 12 feet at H.W. springs that rise 3 feet. Being an old structure, when taken over by the government, it has at different times required repair so as to keep it passable for traffic.

During the past fall, after the severe storms of September and October, the sum of \$49.91 was expended in making necessary repairs, the work done consisting of replacing covering, floor stringers, &c., on outer blocks, where they had been moved out of position by the tidal wave of 11th October, putting in piling for support, and filling in holes washed out in the roadway approach.

Total expenditure up to June 30, 1901, is \$4,249.34.

This work was transferred to control of the Department of Marine and Fisheries on August 25, 1885.

## CHINA POINT.

China Point pier, Queen's county, is situated on the west side of the Orwell river, near its entrance into Orwell bay.



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Originally built by the local government, its control was, in 1884, assumed by the Dominion government. The work has in all a length of 426 feet, consisting of shore abutment or approach 140 feet long, six blocks with intervening spans, and pier head fronting 72 feet on the channel and having a width of 37 feet, carrying 14 feet at low water or 22 feet at H. W. springs, that here rise 8 feet.

During the past season the sum of \$36 was expended in the removal of some timber and ballast the remains of an old block, that was said, at extreme low water, to endanger approach to the pier-head from the southward.

Total expenditure to June 30, 1901, \$8,821.58.

This wharf was transferred to control of Department of Marine and Fisheries August 24, 1888.

#### CRAPAUD.

Crapaud or Victoria Pier, Queen's county, is situated at the head of navigation, inward of 'Crapaud basin' at Victoria village, which is the most important point next to Summerside on the south-western coast of the island, it is about midway between Charlottetown and Summerside harbours, and about 11 miles by road distant south from Emerald junction on the line of the Prince Edward Island Railway.

The pier has a length of 486 feet, consisting of a shore abutment or approach 276 feet long and 20 feet wide, a middle section of 210 feet and 37 feet wide, and a pier head which is 58 feet wide and 73 feet long, the height is about 20 feet at the outer end where the depth of water carried at low tide is 9 feet or 17½ feet at H.W. springs that rise here 8½ feet.

During the past season extensive repairs were made to all of the wharf, new floor stringers, flooring, fenders, mooring posts and guard timbers being put in on the pier head, covering on middle section repaired where required, side walls of approach reconstructed, and the roadway filled in with poles, brush, broken stone and gravel; a small freight house (12 x 16 feet) that was much required being built near the outer end of the pier head, the cost was \$1,197.63.

Total expenditure up to June 30, 1901, is \$18,620.49.

This pier was transferred to control of the Department of Marine and Fisheries, August 24, 1888.

#### HURD'S POINT.

Hurd's Point pier, Prince county, is situated on the southern side of Bedeque or Summerside harbour, and about 3 miles south of Summerside, the shire town of the county.

The pier is a most important shipping place, being about the only outlet for the surplus produce of a large and rich agricultural district. It is also the calling place for the ferry steamer plying in the harbour and which makes several trips daily between Summerside and the pier. It is 510 feet in length and 26 feet in width, excepting the outer 50 feet where the width is 65 feet. During the year 1896 general repairs were made.

Considerable dredging was done in 1899.

During the past season the sum of \$499.46 was expended in the renewal of floor stringers, covering, guard timbers and mooring posts, making up the roadway approach with gravel and in building a crib-work support under the inner span that had been broken down.

Total expenditure up to June 30, 1901, is \$7,317.11, and \$8,917.20 for dredging.

This work was transferred to control of Department of Marine and Fisheries on August 24, 1888.



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## MIMINIGASH.

Miminigash Harbour, Prince county, is situated on the north-west coast of the island about 15 miles from North Cape, and 18 miles from West Point. Previous to its improvement by the department it was one of the numerous ponds along the coast emptying into the Straits of Northumberland, the channels or outlets from which, passing as they do, through shifting sand beaches, are constantly changing, and at times blocked up when severe storms occur ; as the entrance to the Miminigash pond, however, is well sheltered by 'Miminigash reef,' a ledge of rock nearly a mile long, which extends about parallel to the shore at about a half mile distant, the site had much advantage over the other ponds on the coast proposed as suitable for the formation of a harbour, and was selected for this after careful examination by the department.

Work was commenced at the place in 1877-8, and at present consists of breakwaters or piers on either side of the entrance or outlet from the pond, these works are placed 56 feet apart, confining the channel and keeping it in one permanent position; the breakwater or pier on the north side is 550 feet long, and that on the south side 350 feet, inward from both are beach protection works to guard against a new channel forming back of the breakwaters, this beach protection is composed of crib-work, on the south side 270 feet long, and on the north side 350 feet. Extensive repairs were made in 1899 and 1900.

During the fiscal year ending June 30 last the sum of \$1,196.93 was expended in repair and in levelling up the outer end of the northern breakwater that had settled as much as 9 feet at the northern corner and 14 feet at 60 feet inward; on the outer beach two protection works, to arrest and accumulate sand, consisting of brush hurdles, about 5 feet in height were built from the inner end of the northern work to the high ground, they are placed about 10 feet apart and have a length of 2,250 feet.

Total expenditure to June 30, 1901, is \$21,242.38.

## NEW LONDON.

New London Harbour, Queen's county, is on the northern side of the island about 10 miles south-east of the entrance into Richmond bay, within its entrance, which has a width of about 1,200 feet, the harbour is about three miles long and nearly as wide, it receives the waters of the South-west, the Stanley, the French and the Hope rivers, these all navigable for at least short distances, and having at them wharfs or places for shipment from which is exported the surplus produce of the surrounding districts, all of which are both thickly settled and the land well cultivated and productive, quantities of general merchandise coal, lumber, limestone, &c., are imported by water. New London not having convenient railway facilities like most other parts of the island, the harbour is largely used as a fishing station and harbour of refuge for both of which it is most convenient for the fishermen, being near some of the best fishing grounds on the Gulf of St. Lawrence.

For improvement of its entrance, which, like all of the island harbours on this coast, is obstructed by shifting sand bar, works were commenced by the department in 1878, these consisting of beach protection and breakwaters on either side of the entrance, their purpose being to preserve and extend the beaches and so by confining the current caused increased scour and improved the water over the bar, which result has been obtained to a satisfactory extent. When the works are in good condition, fully 11 to 12 feet of water is carried at low water, while before the building of the works from 6 to 7 feet was the best obtained at the same stage of tide. Since construction the western work, which is 400 feet long, has received no injury, the eastern one, however, which was built to a length of 1,120 feet, has, several times, suffered severely, being exposed to a strong current, action of running ice and at times a heavy sea.

During the past season the reconstruction of 300 feet in length of the beach protection was commenced, but while in progress the storm and tidal wave of October 11,



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1900, destroyed what work had been done, and carried away materials provided, added to which, other parts of the works were found to be so injured that the reconstruction of a length of fully 600 feet was required, further work for the time was suspended, after picking up what materials was possible and placing them in safety, expenditure in all on the work done and materials secured being \$248.70. Plan and specification for reconstruction, &c., of the works required, having been prepared, these were let under contract June 18, 1901, when the work was at once commenced.

The expenditure for the fiscal year was \$312.58.

Total expenditure to June 30, 1901, is \$22,442.43 ; and \$11,601.50 for dredging.

#### NORTH CARDIGAN.

North Cardigan or Newport pier, King's county, is situated on the north side of the Cardigan river, about 5 miles from Cardigan station, on the line of the Prince Edward Island Railway, and is one of the Prince Edward Island piers control of which was assumed by the Dominion government in 1884.

The pier has a length of 381 feet, consisting of shore abutment 100 feet long, with seven blocks from 19 to 25 feet long, with intervening spans, which vary from 14 to 26 feet, is from 23 to 25 feet wide out to the outer block or pier head, which has a width of 32 feet ; the approach and all the blocks are constructed of close-faced timber work, filled in with brush, stone and gravel, the latter forming the roadway, and the two outer blocks and all of the spans are floor-stringered and planked over. Being an old structure and much out of repair, when its control was assumed by the Dominion government, it required repair almost yearly to keep it passable for traffic.

During the past season the storms of September and October, particularly the one of the 11th of the latter month, greatly damaged the work ; the outer blocks being carried away nearly to low water, and floor-stringers, covering, &c., of spans washed away ; as much as possible of the material was picked up, and such temporary repairs made as to render it, out to the second block, fit to ship from. The expenditure amounted to \$132.44.

Total expenditure to June 30, 1901 is \$4,990.82 ; and \$7,145.71 for dredging.

This work was transferred to control of Department of Marine and Fisheries on May 24, 1888.

#### PINETTE PIER.

Pinette Pier, Queen's county, is situated on the south side of the Pinette river, immediately below and at right angles to the public road bridge crossing the river, being connected with the bridge by a span of 28 feet in length.

The pier is 120 feet long by 28 feet wide, and is constructed of close-faced timber, ballasted, floor-stringered and planked over ; it faces on the channel, where a depth of 8 feet of water is carried at low water, this having been obtained by the dredging done in 1881, since when no shoaling of any extent has occurred. The pier being very old and much out of repair when it was assumed by the Dominion government in 1884, general repairs have several times since been required.

During the past season the sum of \$496.24 was expended in levelling up the channel face, putting in new floor-stringers, covering, guard timbers and fender piles ; some 40 of the latter were well driven along the outer end and channel face.

Total expenditure to June 30, 1901, \$3,722.92, including \$1,849.20 paid to provincial government in 1885.

This work was transferred to control of Department of Marine and Fisheries August 24, 1888.



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## POWNAL.

Pownal Pier, Queen's county, situated at the head of the north-eastern portion of Hillsborough bay, about nine miles from Charlottetown, was built by the local government many years before confederation, it is in all 753 feet long, consisting of shore abutment or approach 209 feet in length, and 16 feet in width, and 14 'blocks' with intervening spans, the inner of the 'blocks' are 14 to 16 feet wide, while the outer ones, forming the pier head, are 40 feet; originally there was little or no water at the pier head at low water, but in 1880-1, in order to afford access to large boats and small vessels at all times of tide, and permit of larger vessels getting to and from the wharf at and near high water, a channel was dredged from deep water outside, 1,275 feet in length and 50 feet in width to a minimum depth of 6 feet at low water to the pier thus forming a basin 250 feet long by 90 feet wide on the eastern side and outer end.

During the past season the sum of \$106.10 was expended on urgent temporary repairs required after the tidal wave and storm of 11th October, which had rendered it unfit for shipment, and when at the time there was much produce, hay, &c., ready to be exported, the work done consisted in replacing planking and stringers washed away from the spans and outer blocks, and in filling in the washout that had taken place in the roadway of the approach.

Total expenditure to June 30, 1901, \$2,634.45, and \$354.66 for dredging.

This work was transferred to control of Department of Marine and Fisheries, August 24, 1888.

## RUSTICO.

Rustico Harbour, Queens county, on the north side of the island, is the most important fishing station on that coast. For improvement of its entrance, which is obstructed by a sand bar, the department during 1881-2-3-4 constructed works on either side for the purpose of confining the current at ebb tide, thus by scour, deepen the water; the desired improvement has to some extent been obtained.

The work on the northern side is, in a way, the most important as it protects an inner low beach on which most of the fishing stages are constructed, it was originally 1,240 feet long (that on the south side being only 450 feet) but through the effect of storms, action of ice, and injury done to it by the 'teredo' 120 feet of its outer end was, by 1894, completely carried away, and the adjoining 150 feet seriously injured. To prevent more of the work from being damaged, extensive repairs were effected under contract in 1895-6, a head block, 30 by 60 feet, being added to the outer end, and the 140 feet adjoining repaired, widened and strengthened when the length of the breakwater was reduced to 1,119 feet. Injury being again done to the works by the storms of 1899, during the past year the sum of \$1,667.02 was expended in repairs, the work done being the construction of a new sloping face on the outer block, general reballasting of work, putting on seaward side for a length of 200 feet a protection of large sized stone founded on a brush mattress, for prevention of scour, and repairs made to the inner work consisting of piles, brush and stone.

Total expenditure to June 30, 1901, \$35,562.22 ; and \$4,203.23 for dredging.

## SKINNER'S POND.

Skinner's Pond, Prince county, is situated on the north-west coast of the island about midway between Miminigash and North Cape, being about 8 miles distant from either, and is 2½ miles from Harper's station on the line of the Prince Edward Island Railway. The pond, one of the many of similar nature on the coast, has a length of about a mile, and an average width of 500 feet carrying over it a depth of from 5 to 10 feet at ordinary pond level, or if reduced to height of low water spring tides of 1



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to 6 feet, its usual height being about 4 feet higher than that of low water springs ; after the spring freshets it is said that the entrance into the pond could be made about time of high water by boats, but this could not be depended on for any length of time, as the channel, being through a shifting sand beach, was liable to be closed on the occurrence of storm from north-east to west.

During the past season, at the urgent request of the residents of the district, the cutting of a new entrance and closing by a dam of the site of the former one was done at a cost of \$1,747.09. The new cut has a length of 350 feet, averaging in width about 30 feet, while the dam is 317 feet long and 22 feet wide.

#### SOURIS HARBOUR.

Souris Harbour, King's county, is situated on the southern side of the island about 16 miles westward from East point, and is most important as a harbour of refuge and a place of shipment, being, during season of navigation, largely used by coasters and fishermen, as the works constructed by the government afford good landing and shipping facilities in a perfectly sheltered area carrying from 12 to 20 feet of water at low tide of sufficient extent for a large fleet of vessels. Souris is also the eastern terminus of the Prince Edward Island Railway, and has in the harbour a deep water wharf from which shipments can be made later in the fall and earlier in the spring than from any other of the island harbours.

The breakwater which was commenced by the department in 1877 has now a length of 1,250 feet, 270 feet of which was constructed by the local government previous to confederation, the whole work stands in deep water exposed to the full force of the sea during southerly storms, and to the action of the ice in the winter, hence since construction it has had to undergo extensive repairs; much of the damage done has been owing to the ravages of the 'Teredo' and to the poor description of stone first used for ballasting, native timber being either destroyed or greatly weakened, in a few years by the former, while a large part of the stone used was converted into sand, leaving the work unfit to withstand the forces to which it was exposed ; both of these defects are so far as possible, now being guarded against, creosoted timber being used for the outer block last constructed, while the ballast being used is of a more durable description.

During the past fall general repairs were effected to the outer and middle sections of the work at a cost of \$1,245.11, and consist in the replacing of ballast, re-fastening of all loose planking or its renewal where required, while on the outer end of the original work, inward of the creosoted block, the faces were rebuilt for a length of about 25 feet and close-piled on the inner side. For the further protection and strengthening of the work a contract was entered into on November 2, 1900, for the delivery and placing of 4,000 to 5,000 cubic yards of large sized stone on the seaward face, and 1,080 cubic yards of this had, by the end of the fiscal year, been placed along the middle section, the stone being brought from the 'Wallace Quarries,' Nova Scotia.

Total expenditure, June 30, 1901, \$200,840, and \$975.87 for dredging.

This work was transferred to control of Department of Marine and Fisheries February 19, 1884.

#### SOUTH RUSTICO.

South Rustico pier, Queens county, is situated near the mouth of the Wheatley river, which empties into the south-eastern end of Rustico bay, and is distant from Hunter River Station, on the line of the Prince Edward Island Railway, 6 miles, and is about 14 miles from Charlottetown. It is one of the Prince Edward Island piers, control of which was assumed by the Dominion government in 1884.



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The pier has a length of 595 feet, consisting of a shore abutment 450 feet long and 18 feet wide, with three blocks placed about 25 feet apart, the inner block being 17 feet wide and 25½ feet long; while the outer ones are respectively 29 and 30 feet wide and 20 and 24 feet long; all of the work being built of close-faced timber and filled in with brush, stone and gravel (the latter forming the roadway), with the exception of the outer blocks and spans, which are floor stringered and planked over. During the storm in the fall of 1899 serious damage was done to all of the work, which was then in an old and decayed condition, and requiring for its repair and strengthening the sum of \$1,500, but only \$504.56 of this amount was available and expended during July and August, 1900, in putting the work in passable state so that shipment could be made from it, the tidal wave of October 11 and the different storms afterwards left it in about as bad condition as before the repairs were effected.

Total expenditure, June 30, 1901, \$4,217.81, including \$657.80 paid to provincial government in 1885.

This work was transferred to control of Department of Marine and Fisheries August 24, 1888.

## SUMMERSIDE.

Summerside Harbour, Prince county, is on the southern coast of the island, and its second shipping port in importance, the town of Summerside being next to Charlottetown in population having about 3,000 inhabitants, and being one of the principal stations on the line of the Prince Edward Island Railway, by which it is distant from Charlottetown 49 miles and from Tignish, the western terminus, 68 miles. During the season of navigation daily communication is had with the mainland by steamers of the Prince Edward Island Steam Navigation Company at Point Duchêne, where connection is made by the Intercolonial Railway to all parts of Canada and the United States. The entrance to the harbour between Indian Head and Phelan point is about one and one-half miles wide, a sand spit, however, partly dry at low water, extends about 3,200 feet from Indian Head at the southern side to where a lighthouse is built on the north side of the spit, the water is shoal for a long distance from the opposite shore, the deep water channel carrying 18 feet at low water springs being only about 500 feet wide inside, the width of the channel carrying 18 feet at low water, is from 400 to 1,200 feet wide. For improvement of the channel as to depth and direction, dredging was done by the department at different times, and during the past fall the dredge *Prince Edward* worked on what is known as the 'Island shoal.'

For protection of the harbour from south-westerly winds, a contract was entered into on May 25, 1900, for the construction of a breakwater to extend 3,145 feet from Indian Head to the outer end of the sand spit on which the lighthouse is situated, commencement was not made of the work, excepting what arrangements may have been made for the supply of materials, until June 12, 1901, when the construction of mattresses was begun, two of these, 34 by 50 feet each, were placed and ballasted with about 50 cubic yards of stone, as well as having the piles, as specified, driven in two rows at 5 feet apart, and in rows at 4 feet centres.

The expenditure for the fiscal year is \$42.60, and for dredging, \$3,478.70.

Total expenditure to June 30, 1901, is \$234.79; for protection works, \$845.87; and for dredging, \$21,465.41.

## ST. PETER'S BAY.

St. Peter's bay, King's county, is situated on the north side of the island, about 35 miles to the westward of East point, and is of considerable extent, running inward about 8 miles, with an average width of a mile and carrying from 8 to 12 feet of water at low tide, its entrance, however, is obstructed by a sand bar having only



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about 6 feet over it at low water, which renders the harbour available only for boats and small vessels, large numbers of which resort to it during the fishing season. To improve the entrance, afford shipping facilities and give better shelter for the fishermen, works were commenced by the department in 1878, and now consist of a breakwater 226 feet long on the western side of the mouth of the harbour, and a beach protection work from the inner end of the breakwater 1,420 feet long and extending to the high land so as to prevent a channel being formed through the low beach or sand flats that are covered at H.W. spring tides.

During the past fall the sum of \$45.06 was expended on the repair of the latter work which had been injured by the high tide of October 11.

Total expenditure to June 30, 1901, \$11,284.61.

#### TIGNISH HARBOUR.

Tignish harbour, Prince county, is on the north or gulf coast of the island, about 6 miles southward of North Cape, and is at the mouth of the Tignish river, where the coast is quite straight for a long distance, gales from the north-east to the south-east throw in a heavy sea and these acting on the shifting sands, of which the beaches are for the most part composed, frequently completely block up the entrance which would remain closed until broken through by some freshet or on the occasion of an extremely high tide.

To keep the entrance permanently open and retain the channel in one place, the government of Prince Edward Island in 1868 began the construction of works on either side of the river to contract the stream at its mouth to a width of 40 feet, the effect of which has been, by increasing the current, to give general increased depth of water and the entrance has never since been closed to navigation during the season. Since confederation the original works have been repaired, raised, and extended by the department; beach protection works also being constructed on either sides over the low-lying beaches to prevent the breaking through of the sea, and a portion of the channel has been dredged, all of which has proved of the greatest benefit, increasing the business of the port, as well as giving good accommodation for shelter for the fishing boats and a place of shipment for produce and general merchandise.

For the strengthening and protection of the northern breakwater, the outer end of which had become much weakened by the action of the ice, ravages of the 'teredo,' &c., a contract was entered into on November 3, 1900, for the construction of an additional block, 40 by 60 feet, to be placed outward and adjoining the end of the work. Commencement of the block was made through the ice in March and was by the end of the fiscal year about one-half completed.

The expenditure during the fiscal year was \$1,992.

Total expenditure to June 30, 1901, is \$51,816.95, and \$5,199.64 for dredging.

#### WEST POINT.

West Point wharf, Prince county, is situated on the north side of Egmont bay, on the eastern shore of Northumberland strait, about 14 miles west from O'Leary station on the line of the Prince Edward Island Railway, and is 35 miles by water from Summerside harbour.

The wharf is one of the Prince Edward Island piers, the control of which was in 1884 assumed by the Dominion government, and was built many years before confederation by the provincial government to give landing and shipping facilities for the district, there being no wharf or harbour, where vessels drawing more than a few feet of water could call, on the coast between North Cape and Summerside, a distance of about 60 miles. West Cape being about midway between these points was considered a favourable site for a pier and the work built is said to have been of much benefit up



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to the spring of 1884, when it was badly injured on the breaking up of the ice, remaining in bad condition until 1898 when it was repaired, reconstructed, and strengthened under contract ; the wharf having then a length of 620 feet, a width of 30 feet, and extending out to a depth of about 7 feet at low water or of 11 feet at H.W. springs. For the purpose of obtaining a greater depth of water and further extension being proposed a contract was entered into on June 5, 1900, for building a length of 100 feet, and this was, by the close of the fiscal year, about two-fifths completed, the width of the work is also 30 feet, as finished on top, and the outer end is in 9 feet of water at low tides. The expenditure for the fiscal year was \$2,325.90.

Total expenditure to June 30, 1901, \$16,598.33, including \$4,226.40 paid to provincial government in 1885.

This work was transferred to control of Department of Marine and Fisheries on August 24, 1888.

## WOOD ISLANDS.

Wood islands, Queen's county, are situated about 30 miles south-east from Charlottetown, and 15 miles to the westward of Cape Bear, and are the most southerly point of the island. Originally two small islands, they are now connected together and to the shore, a sand-spit also extending out from the shore to within 300 feet of what had been the eastern island, and forming within it, and the western island with connecting sand beaches, a large, shallow pond having an area of about 300 acres, the outlet of which is at the eastern end of the eastern island.

Here the formation of a shipping place was commenced by the provincial government in 1859, but at no time were the works put in such condition as to be of much benefit, as portions of them were either in a damaged or unfinished state. During 1894-5 entire reconstruction and repair of the northern work, 2,520 feet long, was effected by the department, and the work on the south side, 550 feet long, repaired, giving beneficial results, as the increased scour caused the removal of a bar of loose sand that formerly obstructed the entrance. The southern work, however, being found not to be of sufficient length, a contract was entered into on November 3, 1900, for an extension of a further length of 400 feet. Material for this was provided during the winter and the construction commenced in May, 1901 ; by the end of the fiscal year the progress made represented about one-third of the contract.

The expenditure during the fiscal year was \$1,526.15.

Total expenditure to June 30, 1901, is \$30,684.39.

## PROVINCE OF NEW BRUNSWICK.

## ANDERSON'S HOLLOW.

Anderson's Hollow, Albert county, is a cove of Salisbury bay, on the north-west side of Chignecto channel, in the Bay of Fundy. Spring tides rise  $40\frac{1}{2}$  feet, neaps  $32\frac{1}{2}$  feet.

The breakwater wharf was begun in 1879 by the construction of a detached block 550 feet from the shore, with which it was afterwards connected. In August, 1885, the work was 290 feet in length, and three years later was carried to the shore. The structure, 25 feet wide on top, was originally 27 feet high above the bottom at the outer end, but, owing to the accumulation of littoral drift, is now 3 or 4 feet less. It is built of round crib-work, lightly battered on the inside, but sloped at half to one and sheathed on the weather face. The breakwater was damaged by storm on November 21, 1895, when a small lighthouse placed at the outer end was swept away, together with part of



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the break, while some of the top work at the head was simultaneously shaken and started. In 1895-6 a small sum was applied to bolting loosened timbers for temporary security. During the fiscal year 1896-7 the inside face of the wharf at the outer end, which had received a heavy list in the storm of the previous year already mentioned, was taken down and rebuilt for a distance of 75 feet on the top and 44 feet on the bottom. The list was taken out, the new face being carried to a height of 15 feet in order to level the top, and new covering was laid for a length of 75 feet. Seventy feet out of 110 feet of dismantled break were reconstructed, and fenders were placed on the inside of the new face. In 1898-9, by an expenditure of \$121.31, 27 pieces of new sheathing were laid and bolted to the sloping face; a cap and face-timbers were inserted, and the gap in the break 40 feet long, left unfinished at the previous repairs, was built up with four tiers of timbers, strengthened with knees. Like many other works in the Bay of Fundy, Anderson's Hollow crosses the direction of the flood stream and of the prevailing winds. In consequence, an accumulation of littoral drift found on the south-west side, which (the work considered as a groyne being now fully charged) travelling around the end, is being deposited under the lee of the breakwater, forming a shoal which is an obstacle to vessels coming to Anderson's Hollow for cargoes of lumber.

In 1900-1 the break timbers for 290 feet, which had been started up from 3 to 9 inches by storms, were restored to position. For 25½ feet at the outer end the break was raised one tier; 8 bridles, 9 inches square, were placed between the knees of the break for a distance of 100 lineal feet; 3 new pieces of 6-inch sheathing were placed on the sloping face, and loose planks were secured with bolts.

Through the shoal obstructing the work on the inside, a channel 300 feet long, 35 feet wide and 5 feet deep, was made by means of a wheel scraper. It was found, however, that the shoal formed again rapidly with the recurrence of any south-west swell. A groyne, 50 feet in length, of piling and 9-inch hardwood timber, was built on the outside of the work, in order to check for a time the accumulation of littoral drift on the inside.

The expenditure for 1900-1 was \$597.40.

Total expenditure to June 30, 1901, is \$14,599.25.

#### BAY DU VIN.

The wharf at Bay du Vin in Miramichi bay, 20 miles from Chatham, and almost opposite to Burnt Church, is a provincial government work, originally 760 feet long, composed of blocks and spans of round crib-work 18 feet wide, with a pier head 80 x 29, standing in 9 feet at L.W. or 14 feet at H.W.

A year or two after completion, the pier head and two outer blocks were swept away by ice, while a third was considerably injured. A sum of \$1,100, voted for expenditure during 1899-1900, being insufficient to effect restoration of the work, a portion of it was devoted to repairing the outer end of the part of the work still remaining. The upper part of blocks 7, 8 and 9 were rebuilt for three tiers in height; stringers were placed over the span between blocks 7 and 8; and block 10, which had settled considerably and had lost a foundation timber, was removed. The wharf was found upon examination to have suffered considerably from the teredo.

In 1900-1 the blocks were levelled where settlement had occurred, new stringers were placed over and between blocks 8 and 9, and new 3-inch covering was laid for a distance of 92 feet; new 10-inch caps were also placed for the same distance, but not secured; 2-inch planking was besides laid diagonally for a length of 269 feet over the central part of the worn covering.

The tops of blocks 8 and 9 were filled with ballast.

During the year a contract was entered into for the reconstruction of the outer end of this wharf, but work had not been commenced by the 30th of June.

The expenditure for 1900-1 was \$778.14.

Total expenditure to June 30, 1901, is \$1,388.28.



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## BACK BAY.

Black bay, Charlotte county, a fishing station about 4 miles west of L'Etang and 2 miles east of Letite, is situated on an arm of Letite harbour.

The provincial government lately built a wharf 239 feet in extreme length, extending nearly to low water, and consisting principally of trestle work. As a wharf, this work being incomplete and being besides exposed to injury from ice, a contract was let on May 31, 1901, for an extension consisting of a block 20 feet square, and a pier head 50 x 30 feet, solidly filled with stone, and giving a depth of about 7 feet of water.

Expenditure for fiscal year, \$179.54.

## BLACK BROOK.

At Black Brook, Northumberland county, 6 miles below Chatham, a terminus of the Canadian Eastern Railway, construction of a wharf by contract was begun towards the end of the fiscal year. When completed the work will be 230 feet in total length, and will consist of a stone embankment 22 feet wide with benched slopes, connected by a span of 16 feet with a pier head of square timber crib-work, 25 feet wide and 40 feet long.

Total expenditure to June 30, 1901, is \$1,785.26.

## BUCTOUCHE.

Buctouche, Kent county, is reached by a narrow and winding channel, navigable for 11 or 12 miles, and 4 to 5 fathoms deep in some places, but with a ruling depth of only 8 feet; Buctouche river flows into Northumberland strait, about midway between Richibucto and Shediac, the embouchure being about 18 miles from each of these places.

Four miles from the sea, at the village of Buctouche, a quay for local traffic was built in 1884-6 at right angles to the bridge and parallel to the river bank. The work is of round timber fendered with piles, and stands in a depth of 17 feet at low water, or 21 feet at high water spring tide, the length of face and width at top being respectively 300 feet and 40 feet. Some traffic in lumber and coal is carried on, while the opening of a quarry above the railway bridge renders it probable that stone may also be shipped from this work. A siding of the Moncton and Buctouche Railway is carried for a part of the way along the back of the wharf but on an independent foundation. From 1886 to 1894 no repairs were made, but in 1894, the wharf having been partially destroyed by fire, repairs were begun, though not completed.

In the year 1898-9, material was procured and in 1899-1900 repairs were made to the upper portion of the wharf; the contemplated work being completed, except the fastening of the fender piles and covering and placing the cap-timber.

In 1900-01, the fender piles and covering were secured for the whole length of 174 feet and width of 25 feet; a waling was run along the face, a cap-timber was laid, and the back of the wharf, 16 feet wide, for a length of 164 feet, was filled in permanently with brush and stone topped with earth; four mooring posts were also driven in and a ballast floor was laid for 133 feet, on which 140 cubic yards of ballast were placed.

The expenditure for 1900-01 was \$556.63.

Total expenditure to June 30, 1901, is \$8,525.87.

This work was transferred to control of Department of Marine and Fisheries on August 19, 1885.



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## BURNT CHURCH.

Burnt Church, Northumberland county, is a fishing and farming settlement situated on the shore of Miramichi bay, about 22 miles north-east of Chatham, and 5 or 6 miles south of Nequac.

During the year 1899-1900 a contract was let for a block and span wharf of round crib-work, 1,180 feet in length, composed of blocks 21 feet long and 20 feet wide, placed 20 feet apart, forming an approach to a pier-head 60 feet long and 40 feet wide, standing in 9 feet at low water. Spring tides rise 5 feet.

By the end of June, 1900, the crib-work of the shore approach, 200 feet in length, had been brought to within a couple of feet of full height; while 12 out of 23 blocks had been sunk in place and brought nearly to the level of high water.

By the end of June, 1901, all the blocks and the pier-head were in place, the former being almost fully ballasted, and the latter being 18 tiers in height. This work is approaching completion.

The expenditure for 1900-01 was \$7,549.

Total expenditure to June 30, 1901, is \$9,337.08.

## CAPE TORMENTINE.

Cape Tormentine at the extreme eastern end of Westmoreland county, is the most prominent headland on Northumberland strait, and the south-western terminus of the winter ferry route between Cape Traverse or Prince Edward Island and the mainland. Spring tides rise  $7\frac{3}{4}$  feet; neaps,  $3\frac{1}{4}$ .

Between 1886 and 1892, a breakwater pier was constructed with a view of forming an artificial harbour for purposes of interprovincial communication, at the extremity of a peninsula which is the nearest point on the continent to Prince Edward Island. The harbour works comprise a straight pier 2,500 feet long with head and return, each 400 feet in length, inclosing a basin about four acres in area with a ruling depth of 15 feet at low water, or 22 feet 6 inches at high water spring tides. For a distance of 1,300 feet from the shore, the pier is a rubble mound 20 feet wide on top with pitched slopes of 2 to 1, while the remainder of the straight portion (400 lineal yards) is built of close-faced crib-work, 30 feet in width. The head and return are of similar crib-work, but are 40 feet in breadth from the base to low water, decreasing to 30 feet at the finished top (4 feet above high water spring tides) and presenting a sloping face sheathed with hard-wood to the north and east. The waters of this part of Northumberland strait are infested by the teredo.

During the year 1898-9, the talus on the northern side, begun at the time of the construction of the work in 1890, was extended 500 feet, or to the end of the straight pier, by a deposit of 2,313 cubic yards of large stone, brought generally at the top to low water mark. About 80 cubic yards in total quantity were added to the talus, also begun nine years ago on the inside of the pier. For 103 lineal feet, the sheathing and face timbers of the sloping face were removed, 200 lineal feet of face timbers were inserted, and 102 close piles were driven. The mail room in the boathouse was enlarged and re-fitted in time for the winter service between the mainland and Prince Edward Island.

In 1899-1900, the talus was re-enforced and extended around the pier-head, a distance of nearly 200 feet, by the addition of 1,232 cubic yards of large stone. The sheathing of the sloping face was either renewed or relaid for a distance of 182 lineal feet; close piles were driven on the inside of the work, and the sides of the ramp were planked.

In 1900-1, sheathing of the sloping face was laid for 191 feet and rebolted for 50 feet. The harbour face was close-piled for a distance of 150 feet at one section and 62 lineal feet at another. Ballast and brush were placed in the work; 16 new longitudinals were laid, and 563 cubic yards of large stone were added to the talus. A



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quantity of creosoted timber was also procured to be used during the next fiscal year. The expenditure for 1900-1 was \$13,986.22.

Total expenditure to June 30, 1901, is \$265,687.19.

This work was transferred to control of Department of Railways and Canals on April 12, 1893.

## CHATHAM.

Chatham, Northumberland county. On the Miramichi stand two principal towns, Chatham and Newcastle, the former 5 miles below the latter.

Chatham, ranking second in order of commercial importance among the ports of New Brunswick, has a population of about 6,000, and is a station of the Canada Eastern Railway.

The Custom House wharf at Chatham consists of 3 faces, viz. : two sides, respectively 171 feet and 89 feet long, and a river face 112 feet in length. This old structure, doubtless originally used as a place of deposit for ship's ballast, had become much dilapidated, and repairs were begun by the department in May, 1900.

By the end of the fiscal year 1899-1900, the greater part of the longer side had been rebuilt and nearly completed. A considerable part of the grading to be done between the faces had also been finished.

In 1900-1, reconstruction of the upper side was completed, the river face was rebuilt with square timber, fendered with piling, and two sides planked on top for a width of 10½ feet. The top of the wharf, within the limits of the departmental property, was graded and sown with grass seed ; old building being removed ; while a gravel drive, 12 feet wide on the sides of the work, expanded to 36 feet in mean breadth at the head, was made around the grass plot. The caps and tops of the fenders were coated with carbolineum. The expenditure for 1900-1 was \$2,999.84.

Total expenditure to June 30, 1901, is \$5,046.02.

## CLIFTON.

At Clifton, in Gloucester county, a station of the Caraquet Railway 10 miles west of Grand Anse and 7 miles east of Bathurst, a breakwater originally 425 feet long, built by private enterprise to facilitate the shipment of stone from the adjacent quarries, was acquired by the department in 1878, and was extended in the same year to the present dimensions. The work of round and square crib-work, partly protected by random stone, is now 750 feet long over all, 220 feet of this length being a pier head placed at an acute angle to the approach, in order to give shelter between east to north-west. The work is 17 to 25 feet wide on top and 22 feet high at the outer end.

General repairs were made in 1886-7 and in 1887-8, consisting of ballasting, sheathing, fendering and restoration of breaches in the work.

General repairs were continued from 1891 to 1893, and the foundation of a talus was placed on the outside.

In 1897-8 general repairs were again made, and a slope of heavy stone, averaging nearly one cubic yard each, was placed for 145 feet around the angle of the work.

Formerly the deepest berth was said to give 11 to 12 feet at low water, but this depth has now been reduced by shoaling. This artificial harbour affords the only shelter for fishing boats between Caraquet and Bathurst, a distance of about 37 miles. Spring tides rise 7 feet.

The face-timbers of this work, now much shaken, are protected by vertical hardwood fenders, which, as there is little bolt-hold, are frequently displaced.

In 1898-9 ordinary repairs were made to fenders, covering and break. During 1899-1900 the talus was continued by the addition of 196 cubic yards of large granite ;



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two serious breaks in the face, respectively 16 and 19 feet, were thoroughly repaired by the insertion of cross-ties and face-timbers, secured by screw bolts to fenders on the outside, and to shores on the inside of the work ; new stringers and covering were placed for a total distance of 209 lineal feet.

Preparations were also made in the same year for construction of the talus, by laying a tramway for carriage of heavy stone from the quarry along and around the work, a turn-table being placed at the angle. Materials were procured for a new hardwood block, 70 x 40 feet, intended to be placed on a dredged foundation for the purpose of stopping the talus at the pier-head, and a part of the materials were framed ready for building.

The absence of a dredge to prepare the foundation has prevented this block from being put together, but the framing was continued in 1900-1. At the angle the top was also repaired for a length of 103 feet and a breadth of 16 feet: 4 new longitudinal timbers in place of stringers, 19 new cross-ties ; and new covering being laid. Two thousand nine hundred and sixty-one cubic yards of stone, principally large, were added to the talus, the top of which was laid for a distance of 124 feet.

The expenditure for 1900-1 was \$4,326.51.

Total expenditure to June 30, 1901, was \$24,462.52.

This work was transferred to control of Department of Marine and Fisheries on November 9, 1894.

#### COCAGNE.

Cocagne, Kent county, on the west coast of Northumberland strait, is 10 miles south of Buctouche. The entrance is over a sandy bar, which has a depth of 10 feet at low water, or 14 feet at high-water spring tides. Inside, from  $2\frac{1}{2}$  to 4 fathoms are found in a narrow channel for about three-quarters of a mile. Afterwards, mud flats,  $1\frac{1}{2}$  miles in length, covered by 4 to 6 feet at low water, extend nearly to the highway bridge, where a depth from 2 to  $2\frac{1}{2}$  fathoms is found in mid-channel.

In 1881-2 the department began the construction of a crib-work quay, 400 feet long and 20 feet wide, leading from the bridge and carrying a depth of from 9 to 11 feet at the face. In 1888 the wharf, having settled irregularly, was levelled up and widened for a distance of 100 feet, and in 1892 received similar attention.

The structure having become worm-eaten and settlement having taken place, repairs were begun in 1898-9 on a part 176 feet long, and by the end of the year were almost completed, with the exception of the ballasting, some stringers and the covering.

During the last fiscal year the repairs undertaken in 1898-9 were finished by the addition of the covering, cap-stringers, bracing and ballasting. The new top was also widened 10 feet at the back by the deposition of 253 cubic yards of stone, brought flush with the covering.

Removal, by agreement, to a little above low water of the abandoned part, was effected in 1900-1.

The expenditure for 1900-1 was \$181.

Total expenditure to June 30, 1901, is \$12,099.32 ; and \$6,451.46 for dredging.

#### DALHOUSIE.

Dalhousie, a seaport in the County of Restigouche, at the head of Baie des Chaleurs, and a station of the Intercolonial Railway, possesses a secure harbour, from 6 to 7 fathoms deep, which, during the season of navigation, is the best in New Brunswick, it is the only one on the gulf coast of the province suitable for a coaling station for the fleet.

For the use of vessels engaged in the deal trade the department added, in 1887-8 to the Intercolonial Railway pier, a ballast wharf, 300 feet long, 23 feet wide on top, placed



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paralleled to the shore in about 15 feet at low water, a depth now reduced by shoaling to about 5 feet in some places. Spring tides rise 10 feet, neaps 7.

Expansion of the ice, consequent upon the cracks caused by tidal fluctuation, exerts from the shore a shearing stress against the top of this work, which was in 1897 thrust over about 10 feet, the displacement extending for about 118 feet along the work.

The top for a length, originally of 118 feet, but afterwards for a length of 167 feet, having been sheared off by ice pressure from the back, is in course of reconstruction.

During the fiscal year, 1900-1, the work was rebuilt a mean height of 4 tiers and ballasted. New covering was also laid over a part of the wharf, but not fully secured; while the battered back was sheathed for a length of 119 feet.

The expenditure for 1900-1 was \$699.08.

Total expenditure to June 30, 1901, is \$13,109.59, and \$4,745.79 for dredging.

## DIPPER HARBOUR.

Dipper Harbour, about 22 miles from St. John, and in the county of that name, is a fishing cove about a mile in length, and rather less than a half mile broad, open to the south-west, where, to replace one formerly built but soon afterwards swept away, construction of a new breakwater is contemplated. In advance of the contract, preparation of the foundation of a new work was begun at the end of October, 1900, by benching the rock, about 200 cubic yards being excavated.

The expenditure for fiscal year, 1900-1, was \$1,039.93.

Total expenditure to June 30, 1901, is \$23,284.45.

## EDGETT'S LANDING.

Edgett's Landing, in Albert county, is on the west side of the Petitcodiac river, two miles below the village of Hillsborough.

To replace an old provincial government work, destroyed by the Saxby gale in 1869, the construction of a wharf was begun 20 years later by the department, and was finally completed in the fiscal year ended June, 1893. The wharf is 400 feet long, composed of an earthen approach 20 feet wide, and 50 feet in length; round crib-work 250 feet, and square crib-work 100 feet long. The head is 40 feet wide. Spring tides rise 46 feet. The pier head, 35 feet high, stands in 30 feet at high water, and is dry at low water.

Renewal of the covering, which had become decayed, and levelling up of the stringers, which had settled, was begun in May, 1900, and was completed in 1900-1.

The expenditure for 1900-1 was \$284.86.

Total expenditure to June 30, 1901, is \$9,930.95.

This work was transferred to control of Department of Marine and Fisheries on June 19, 1895.

## FORT DUFFERIN.

Fort Dufferin (St. John Harbour), a 10-gun battery built by the British government on a headland to command the western entrance to St. John harbour, stands at the shore end, but much above the level of Negropoint breakwater.

In order to preserve the headland from erosion by the waves, this department began in 1882 a retaining wall of sheathed crib-work 430 feet in length, and in the following year constructed a further length of 303 feet. The work is exposed on the one hand to the force of the waves and on the other to land-slips. In 1886-87 it was much disturbed by the sea, and repairs were made in that and the following year, 205 feet of the original work being rebuilt. From 1887 to 1889 repairs were also made, and in 1890 the work was extended 100 feet. General repairs were made in 1893-4.



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The work is 7 to 14 feet wide on top and about 9 feet in mean height. The crest for almost the whole length is surrounded by a break  $2\frac{1}{2}$  feet high.

During the year 1896-7 a gap 81 feet long in the break was repaired, 200 lineal feet of longitudinals were renewed inside, and 128 cubic yards of ballast were restored to the work, while the sheathing was patched at intervals along the face with hardwood planking. In order to raise the beach and reduce the area of timber face necessary to be repaired, towards the end of 1896 a groyne, 40 feet long, 10 feet wide and 4 feet in mean height was built of hardwood piles, timber and stone. In 1897 the final extension of the crib-work, a distance of 130 feet was begun, and by the end of the year 1896-7 was brought within two tiers of the full height.

In 1897-8 the new extension, making the work 945 feet in total length, was completed, ballasted and sheathed. Small repairs were also made to the sheathing of the old work.

In 1898-9, four groynes, in all 232 lineal feet, each built of hardwood piles 4 feet apart, driven from 9 to 12 feet into the bottom and planked with birch 9 inches square, securely strapped and bolted, were placed along the beach to protect the lower part of the sheathing of the breastwork; some ballast was also placed in the crib-work.

Ordinary repairs, comprising restoration of a breach in the face, ballasting and renewal of sheathing, were made during the year 1899-1900.

In 1900-01, the face was sheathed for 145 lineal feet; 10 piles were driven to restore, with the addition of crib-work, a breach 11 feet long; 62 lineal feet of large hemlock face timbers were inserted; some loose piles were rebolted, and 373 cubic yards of ballast were placed in the work. At the upper end the breastwork was repaired for a distance of 235 feet by placing a new tier of 12-inch cross-ties; 395 lineal feet of face-timbers; and by the insertion of 24 knees, with as many choeks, secured by screw bolts.

The expenditure for 1900-1 was \$1,899.92.

#### GRAND ANSE.

At Grand Anse, on the coast of Gloucester county, 9 miles east of Clifton or Stonehaven, and 27 miles in the same direction from Bathurst, the department began in 1876 a detached breakwater of square timber. The construction and repairs continued at intervals up to 1890. The work consists of a shore arm 159 feet in length and pier-head 237.5 feet long, the latter presenting a sloping face.

During the fiscal year, the sloping-face was repaired by the addition of 247 lineal feet of new longitudinals, and  $81\frac{1}{2}$  lineal feet of sheathing; five new floor-stringers, extending throughout the full length of the pier-head; two new cross-ties; and 47 lineal feet of cap-timber. The break was rebuilt for a length of 200 lineal feet with 12 x 12 timbers, strengthened with 19 knees. Seventeen close-fenders were driven and secured to repair damage caused by the teredo to the vertical face; while new covering was laid for a distance of 46 lineal feet.

By deposit on the inside of ballast, washed out of the work when wrecked in former days, and perhaps by interception of the littoral drift, the sheltered area, originally small, has become shallow. A contract was let for extension of the work towards the land, which also includes deepening of the harbour. The breakwater is exposed to the severe storms of Bay Chaleur, ranging between N.E. and N.W.

This work is more of local than of federal importance.

The expenditure for the fiscal year amounted to \$1,464.39.

Total expenditure to June 30, 1901, is \$21,394.11.



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## HOPEWELL CAPE.

Hopewell cape, in Albert county, near the mouth of the Petitcodiac river, and at the head of deep water navigation, is one of the several works on that stream intended for the convenience of shipping.

For the use of vessels proceeding to Moncton, Hillsborough, and Dorchester for cargoes, the department in 1883 began the construction of a ballast wharf of round crib-work, 300 feet in length and 22 feet in width, which was completed in the following year.

In 1885, the work was extended to the present length, 583 feet, by an addition built of square timber.

The covering, stringers, and other upper timbers having become decayed, preparations were made in 1899-1900 for repairing the work, by the purchase of materials; at the end of that year part of the timber had been delivered.

In 1900-1, the outer end, for a length of 283 feet, was rebuilt for a height varying from 4 to 6 feet. The top of the pier-head was also rebuilt. A length of 30 feet at the inner end still remains to be completed.

The construction, by contract, of a new wharf intended to be 460 feet long, was begun in April, 1901; by June 30, the shore approach had been built for a length of 195 feet and was 21 feet high at the outer end.

The expenditure for 1900-1 was \$1,982.75 for construction, and \$1,500 for repairs.

Total expenditure to June 30, 1901, is \$12,724.94.

This work was transferred to control of Department of Marine and Fisheries on April 13, 1886.

## HOPEWELL HILL.

At Hopewell Hill, in Albert county, on Shepody river, an arm of the Petitcodiac, a contract was let for a new crib-work wharf, to be 101 feet in total length.

By June 30, 1901, work had just been commenced.

Total expenditure to June 30, 1901, is \$12.50.

## LAMEQUE.

Lameque is a post settlement in Gloucester county on Shippegan island, 3½ miles from Shippegan.

A contract was let in 1899-1900 for the construction of a block and span wharf, 990 feet in total length.

By the end of 1900-1, the shore approach, 220 feet long, had been brought up to the level of 1½ feet above high water. Five of the blocks of the wharf had also been built, placed, and brought up to 1 foot or 1½ feet below high water.

Expenditure for fiscal year to June 30, 1901, is \$1,722.

Total expenditure to June 30, 1901, is \$1,836.63.

## L'ETANG.

L'Etang, in the County of Charlotte, is one of the best harbours on the coast of New Brunswick, and according to the Admiralty Sailing Directions, one of the most convenient in North America, in point of entrance, capacity, shelter, depth and holding ground. The harbour is famous for sardines, and close beside a small provincial government wharf, a cannery has been erected for the purpose of preserving the fish, the output of which is expected to be worth from \$50,000 to \$75,000 annually. Since spring tides rise 23½ feet, the provincial government wharf, only 12 feet in height at the outer end, was of course dry at low water.



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Greater depth being necessary to allow shipment of the cases of sardines, a sum of \$400 was allowed by the department towards procuring the depth (20 feet at H.W.) required by the vessels engaged in carrying the output of the factory. During the month of June, 1900, a block of round crib-work, made of small timber, 30 feet long, 20 feet wide, and 15 feet high, standing in 20 feet at H.W. was built, but not completed, at a distance of 110 feet from the end of the old wharf. With a small grant from the provincial government an approach of trestle bents was made to the new block.

During the fiscal year the work done consisted in completing the block by building it 10 feet higher.

The expenditure for 1900-1 was \$346.73.

Total expenditure to June 30, 1901, is \$735.57.

#### LETITE.

At Letite, situated in Charlotte county, is a minor channel or passage from the Bay of Fundy into Passamaquoddy bay, where the provincial government recently built, at a fishing settlement 9 miles from St. George, a slightly constructed wharf at which a small local steamer touches. To make an addition to the pier head, \$500 was utilized as far as was found practicable by June 30, 1900, in purchasing timber and iron.

In 1900-1 a block of round crib-work, 26½ feet long, 19½ feet wide on top, and 27 feet in mean height was completed.

The expenditure for 1900-1 was \$396.70.

Total expenditure to June 30, 1901, is \$710.35.

#### LORD'S COVE.

Lord's Cove is a small fishing settlement on Deer island, an outlying part of the County of Charlotte.

In 1900-1 a sum of \$1,000 was granted to be applied towards construction of a new wharf intended as a public landing for the locality, and for the accommodation of a steamer plying between St. Stephen, Eastport and the ports of Passamaquoddy bay.

By the end of June, 1901, 12 trestle bents and 3 pile bents of the approach had been erected; the cutting had been carried through and the stone embankment partly made.

Total expenditure to June 30, 1901, is \$1,000.

#### MAIN RIVER.

Main River is situated in Kent county, about 12 miles above Richibucto, on the river of the same name.

The construction of a new wharf was begun early in 1900.

This work, 150 feet in length and 30 feet wide, is composed of round crib-work in two blocks, respectively 45 and 75 feet long, with an intervening span of 30 feet. The face gives 11 feet at low water. By the end of June, this new wharf had been brought up to 16 tiers of longitudinals and cross-ties in height; all the stringers had beside been laid, and a length of 45 feet of wharf had been covered with planking; 21 fenders and 2 mooring-posts had also been placed in position, and the approach (54 feet long) from the main road had been completed.

In 1900-1 the remainder of the covering and fenders were laid, the cap-timber and curb placed in position, some graveling done and the whole work finished.

The expenditure for 1900-1 was \$335.40.

Total expenditure to June 30, 1901, is \$2,784.06.



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## MISPEC.

Mispec, St. John county, is situated 8 miles east of the city of St. John.

A breakwater 198 feet long, of square crib-work, was built in 1885 on the west side of the inlet, at some distance from the mouth.

Spring tides rise 26 feet.

Repairs were made in 1889-90 to the seaward face, and again in 1892-3. Repairs were again begun in 1898-9, when 7 tiers of the face, for a distance of 74 feet along the work, were replaced with heavy birch timbers, 16 inches square, secured by screw bolts.

This breakwater was, however, found insufficient for the protection of the rafts of pulp-wood and of the schooners and lighters engaged in carrying coal, sulphur and limestone to the mill, or in transporting pulp, when manufactured, from the mill to St. John for shipment. On this account a contract for a new breakwater to be placed on the east side of the entrance was let.

Preparation of the foundation was begun by day labour, by benching the rough rock on which the work will stand.

The expenditure for 1900-1 was \$980.38.

Total expenditure to June 30, 1901, is \$12,069.54.

## NEGROPOINT.

Negropoint, is a headland about 60 feet above high-water mark at the western entrance to St. John harbour, which is formed by the estuary of the River St. John on the northern side of the Bay of Fundy, and situated in the county of St. John.

Spring tides rise 25.3 feet, neaps 20.

In addition to convenience of position for distribution by rail of cargoes landed at the city of St. John, St. John harbour is remarkable principally for great tidal range and for consequent freedom from ice in the winter months. The harbour is open, broadly speaking, from south-east to south-west, but southerly waves are broken by Partridge island, and south-west waves are mitigated by Negropoint breakwater, while the foul ground, a shoal tailing down from the peninsula on which the city is built, must have more or less effect in moderating the force of south-easterly seas rolling around Mispec point.

By Partridge island, a rocky eminence devoted to quarantine and lighthouse purposes, the entrance of St. John harbour is divided into east and west channels. In the former or main channel a minimum navigable depth of 19 feet is found on the bar at low-water ordinary spring tides. Two hundred yards inside the crest of the bar, a depth of 5 fathoms is found in the narrow fairway, while higher up, between the principal wharfs, on either side of the harbour (450 yards broad at that point), 12 fathoms are given in mid channel. The west channel, 10 to 14 feet deep at low water and originally 1,200 yards wide, has been contracted by the Negropoint breakwater, extending 2,200 feet in a S.E. by S. direction from the headland so styled. The breakwater was begun in the spring of 1875. In 1881 a contract was entered into for the reconstruction of 1,300 lineal feet of crib-work which had been swept away in February, 1879; the work was completed six years afterwards. From 1891 to 1894 desultory repairs were made by addition of large stones, chiefly deposited about the end, to prevent the lighthouse from being undermined.

In 1895 four large blocks of concrete were placed for the same purpose in front of the pier at its base.

In 1895-6 seven concrete blocks, founded at about the level of low water neaps, were built *in situ* around a quadrant of the outer end, to receive the foot of a slope, proposed to be laid of heavy granite blocks, inclined 4 to 1. The work was successfully carried out.



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From October, 1896, to June, 1897, fifteen blocks of concrete, forming aprons, were laid in position at outer end of the work, and a quantity of stone which had been removed from its original position was relaid.

The break of piles, brush and stone which was commenced in 1895 was completed in 1896-7 and extended a distance of 140 feet.

In 1897-8, 152 cubic yards of granite were deposited about the lighthouse pier ; the timber break was extended a further distance of 80 feet and a small groyne was constructed. In 1898-9, one thousand and nineteen cubic yards of granite were laid in place, and 285 yards of the original stone, displaced by sea, were restored to position.

In 1899-1900, 414 cubic yards of granite were placed around lighthouse ; 606 yards of stone, displaced by sea, were relaid, and five concrete blocks were constructed.

In 1900-01, five blocks of concrete, aggregating  $54\frac{1}{2}$  cubic yards, were built *in situ* ; 1,313 cubic yards of new granite were received and placed, while 1,893 cubic yards of the original stone of the breakwater, removed by the sea, which on November 8, 1900, made two clear breaches through the work, were restored to position. The timber break was extended two tiers for a distance of 40 feet.

The expenditure during the fiscal year was \$7,689.70.

The total expenditure on Negropoint and Fort Dufferin to June 30, 1901, is \$494,317.16.

#### POINT DU CHENE.

Point du Chene (Shediac) is situated in Westmoreland county. In a bight formed by an abrupt easterly trend of a coast line north and south in general direction, is a natural harbour giving about 14 feet at low water or 18 feet at high water spring tides. This place, 40 miles south of Richibucto, and about the same distance west of Cape Tormentine, is a station of the Intercolonial Railway, a point of steam communication with Prince Edward Island, and a deal port.

To protect the Intercolonial Railway pier at Point du Chene in Shediac harbour, a work weakened by the teredo, the department built in 1875 a detached breakwater 600 feet in length. Four years later the outer end of the breakwater was connected with the head of the railway pier by a wharf 205 feet long intended for the reception of ballast discharged by deal vessels. In 1881, another independent breakwater, similar to the first, and of the same length, was built to protect the shore end of the railway pier.

The breakwater built in 1875 having become worm-eaten, notwithstanding repairs made in 1883 and 1888-9, was destroyed by a storm in 1891. In 1893 a contract was made for reconstruction, and by the end of the following year the work was completed. The new breakwater proper is 600 feet long and generally 27 feet wide at the base, sloping at the rate of one to one, from low water to 6 feet above high water spring tides. At the northern end, connection was made with the damaged ballast wharf by an additional length of 40 feet of similar work. The outside faces and cross-ties of the substructure are creosoted timber, protected by close-piles and by fender piles, also creosoted. The remaining timbers and the superstructure are untreated wood.

In 1896, the close-piling of the ballast wharf having been cut off by the teredo, repairs to the face, 183 feet long, were undertaken. In order to remove weight from the worm-eaten block, the superstructure was supported at the face on creosoted piles, and in the body of the work by untreated hard-wood piles driven through it. This new top, 20 feet wide and 8 feet high, was faced with square timber, ballasted and well braced with short piles driven into the ship's ballast, deposited behind the crib-work.

In 1898-9, 23 fenders which had started from the face of the work were made fast.



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During the fiscal year 1900-1, 7 fenders, split and chafed by the surging of a vessel during a storm, were retopped, while 36 bridles in all were placed between the whole of the fenders along the face at a cost of \$25.

Total expenditure to June 30, 1901, is \$82,489.47, and \$12,654.89 for dredging.

## POINT WOLFE.

Point Wolfe is a small natural harbour in Albert county, on the north shore of the Bay of Fundy, about 57 miles east of St. John. The river mouth gives an indraught from the bay 1,800 feet long and 700 feet wide. The harbour lies at the upper end of the embouchure and is formed by a beach or bar, 1,000 feet long, 200 feet wide, and 14 or 15 feet higher than the flats. The crest of the bar is being denuded by the waves to the detriment of a sheltered basin inside.

A contract was let for the construction of protection work, 896 feet long, intended to prevent further denudation, and to effect restoration of the beach to the original height. Work had not been commenced by June 30, 1901.

Total expenditure to June 30, 1901, is \$184.57.

## QUACO.

Quaco, St. John county, is on the northern coast of the Bay of Fundy, about 30 miles to the north-eastward of the entrance to St. John harbour.

The harbour is dry at low tide, and only accessible for coasting vessels and schooners, which come to load timber, &c., or to seek shelter for about 6 hours during each tide.

Spring tides rise about 30 feet, and neaps 23 feet.

The west breakwater which had been damaged by storms for a distance of 149 feet, the sheathing and several longitudinals of the sloping outside face being stripped off and a quantity of ballast out, was repaired during the year ended June 30, 1897; besides which the east breakwater was protected by brush and stone placed along the foot of the cribwork to prevent scour from the fresh water stream.

On the western breakwater the longitudinal face-timbers, of the damaged part, were generally renewed with birch, 14 inches square, and secured, where possible, with screw bolts. The stone washed out was replaced, and some additional ballasting done. The face was also covered with new sheathing for the distance mentioned, two fenders were renewed and a ladder placed near the shore end. Thirteen new fenders were also placed on the east pier, and the decayed tops of five others replaced by sound material. Small repairs were made to the covering and sheathing, and another ladder placed against that work.

In 1897-8, by the striking of a schooner, the corner fenders and sheathing of the west pier were started from their position. The damage done was repaired by closing a small opening and strapping the angle.

In 1900-1, the cap and two tiers of the face of the approach to the east pier were renewed for a distance of 84 feet; while 2 new face-timbers and a cap were also placed on the pier-head for a length of 39 feet, 14 new fenders, each 22 feet long and 12 inches square, were applied to two corners of the pier-head, and were protected with 10 iron straps, 2 new fenders were also placed inside the east pier, and as many new pieces of sheathing were placed on the west pier at a cost of \$420.95.

Total expenditure to June 30, 1901, is \$38,321.32.

This wharf was transferred to control of Department of Marine and Fisheries on June 21, 1892.



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## RICHIBUCTO.

Richibucto harbour, Kent county, is a deal port on Northumberland strait and terminus of the Kent Northern Railway, 38 miles south of Miramichi, and about the same distance north of Shediac ; it is formed by the mouth of a river which is tidal for 22 miles.

The works, originally proposed for the improvement of the harbour, were two breakwaters, one to extend from the southern point of the north beach in a south-easterly direction 1,200 feet, and the other to run in a north-easterly direction from the south beach, the object being to confine the water in one permanent channel, and so scour the bar. In February, 1873, the north pier was begun, and by September, 1874, had been constructed for a distance of 1,200 feet. In 1876 it was found that the sea, during easterly storms, followed the inside of the breakwater, swirled around the upper end, and endangered the beach. From 1880 to 1882 protection works were extended westward along the face of the beach to prevent erosion. Extension in the same direction was continued in 1888 for 200 feet, in 1889 for 300 feet, in 1890 for 94 feet, and in 1891 for 140 feet. The works are now 2,158 feet in length, and are composed principally of brush, stone and piling. No pier has yet been started from the south beach, and consequently no increase of the depth on the bar has yet been effected.

The works have suffered much from decay, from the sea, and from ice action. During the year 1898-9 repairs were undertaken, and reconstruction of a part 238 feet long was nearly completed by the end of June, while repairs to the adjacent part, 593 feet long, including raising the structure 3 feet, were also nearly finished.

In 1899-1900 the repairs of the inner part of the north pier were completed ; a groyne, 33 feet long and 15 feet wide, made of a brush mattress, piles and large stone, was built, and another groyne, 33 feet long, was rebuilt outside. Two brush groynes, 191 feet in length, were built inside ; while a new breastwork, 470 feet long and 8½ feet wide, composed of pile framework, sheathed on the outside and filled with brush and stone, was constructed on the seaward of the beach, with the object of intercepting the drifting sand and preventing erosion. In this the work has been eminently successful.

In 1900-1 a steam derrick was built ; the north pier, for a length of nearly 900 feet, was filled with brush and stone ; while a latus of heavy stone, variable in height, laid on mattresses (formed of fascines and evergreen brush, pierced with piles), was carried along the outside of the decayed close-piling for a distance of 492 feet. Either a lacing or protection of brush, in some places ballasted with stone, was applied to the back of the work, to prevent further erosion of the beach during reconstruction, for a distance of 310 feet. Three groynes, intended to induce accumulation of the dry sand drift, aggregating 262 lineal feet, were also built. Four thousand five hundred and fifty-three cubic yards of stone were placed in the work.

The expenditure for 1900-1 was \$16,822.66.

Total expenditure to June 30, 1901, is \$81,284.36 ; and \$36,074.42 for dredging.

## RIVER ST. JOHN AND TRIBUTARIES.

The River St. John proper, 450 miles long, takes its rise from sources in the province of Quebec and state of Maine, at a reputed maximum altitude of 2,159 feet above the sea level. Entering New Brunswick at the confluence of the St. Francis, a little below the borders of Quebec, it continues to be the international boundary almost to Grand Falls, and after flowing through the province for nearly 300 miles (by way of the counties of Madawaska, Victoria, Carleton, York, Sunbury, King's and Queen's) discharges into the Bay of Fundy at St. John. Many tributaries, some being of considerable magnitude, are received by the main stream. Among them are the St. Francis, Madawaska, Green river, Grand river, Salmon river, Aroostook, Tobique, Pres-



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qu'ile, Maduxikaeg, Eel river, Mackawick, Keswick, Mashwaak, Oromocto, Jemseg (Grand lake), Washedomoak, Bellisle, and Kennebecasis. Except the last five, which are slightly tidal for some distance, they are fresh-water streams.

The total basin from source to mouth is computed to be 26,000 square miles, an area almost equal to the whole of New Brunswick, but as a part of the watershed lies outside, only a little more than one-half the province is drained by the river. The St. John is considered navigable for vessels 15 feet in draught for a distance of more than 50 miles from the mouth, but no positive information on this point has yet been obtained. About 8 feet at low water can be carried to Fredericton, 84 miles from the sea and 6 miles below the head of tide at Springhill.

For the purpose of description of works, three divisions may be made in the river:—

1. Tidal navigation for steamers and sailing vessels between St. John and Fredericton, 84 miles, requiring 11 feet at low water. Principal obstructions: the Oromocto shoals, about  $1\frac{1}{2}$  miles; the middle ground above Oromocto island, about 1 mile, and the shoals abreast Fredericton, rather more than  $\frac{1}{2}$  mile in length. The last are now dredged, but the other obstacles remain.

2. Inland navigation from Fredericton to Woodstock, a distance of about 65 miles, requiring  $3\frac{1}{2}$  feet at low water. The obstacles to inland navigation, besides boulders in some places and perhaps bed rock at Meductic, are shoals of material more or less coarse, according to the strength of the current, varying in composition from sandy gravel to stones. The chief bars are at Springhill and Bear island; while Knapp's, Perley's, Coac, Nacawick, Belvisor, Moore's, Bett's, Dibbles, and Bedell's bars, with Meductic rapids, constitute, according to present information, lesser obstructions. Dividing above Springhill into two main channels, and from a general width of 350 yards, opening to a stretch of  $1\frac{1}{2}$  miles between banks, with a waterway increased by at least one-third, the river becomes dotted with eyots and shallows. Two gravel shoals, known as the Russel and Chapel bars, together about half a mile in length, compose the obstacle at Springhill. At Bear island, 25 miles above Fredericton, in consequence of another division of the river into three channels aggregating 600 yards in breadth, a shoal of gravel and stones one mile long, giving 21 inches at low water, has been formed. Besides dredging, a long training dike will be necessary for the maintenance of this channel. After reuniting below the island, the width of waterway in the single channel is only 250 yards.

3. The upper river, including with the tributaries, all that part above Woodstock. This division is now used for the passage of timber only. On some of the tributaries beyond the reach of railways, supplies for the lumber camps are transported in tow boats, for which channels are required to be made and tow paths provided.

The expenditure during the fiscal year was \$3,228.44.

*Tidal Navigation.*—In the tidal navigation, dredging was done on Oromocto shoals and on the Salmon river during the year 1900-1.

*Inland Navigation.*—In 1900-1 a small grapple dredge worked on the shoals at Springhill.

Inspections were made of Hartland bridge to ensure that sufficient headway was given to comply with the conditions of an Order in Council, dated March 10, 1900.

The tow-paths below Middle Southampton were repaired and improved at intervals for 9 miles. The improvements comprehended clearing, grading, blasting and the construction of stone retaining walls.

#### *Main River.*

(Salmon river to River des Chutes).—Between Salmon river and River des Chutes, 99 cubic yards of rock were blasted from the channels and banks at Baker's Little river and Aroostook bar.

#### *Rapide de Femme.*

At Rapide de Femme, 50 cubic yards of rock were removed.



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*Green River.*

On Green river, between the mouth and Third Falls, a distance of 16 miles, channels were scraped, boulders blasted, obstructions removed, and tow-paths cleared.

*Tobique River.*

On the right hand branch, a crib-work dam 63 feet long, 28 feet wide and 5 feet high, was built at the Forks, and from that point to rocky bend, a distance of 3½ miles, the channel was improved by removal of rocks and boulders.

On the Serpentine, two wing dams were constructed, one 59 feet, and the other 94 feet in length, to facilitate the passage of timber.

On the left hand branch, a channel 150 feet long and 25 feet wide was scraped, about a mile above the Forks. Between that point and the foot of Blue Ledges, a distance of 4 miles, occasional boulders were removed from the channel. At Blue Ledges a channel 3,000 feet long, 10 feet wide and as many inches deep, was blasted through solid rock. Rocks and boulders were also removed from the channel for a distance of 325 feet.

On the main Tobique, channels were scraped through the following bars:—

	Length of channel.	Width of channel.
Waters, 29 miles above Plaster Rock.....	220	20
Blackguard Id., 28½ miles above Plaster Rock ....	150	20
Ganz, 26½ miles above Plaster Rock....	350	20
Swift Id., 23½ miles above Plaster Rock..	60	18

*St. Francis.*

At Cross Lake rapids, a channel, 350 feet long and 20 feet wide, was made by removal of boulders and rocks. At Oak's bar, a channel 50 feet long, and 30 feet wide ; at Jones' bar, a channel 45 feet long, and 25 feet wide ; at Abb's island, a channel 80 feet long, and 30 feet wide ; at Abb's bar, a channel 200 feet long, and at Grew bar, a new channel 500 feet long, and 30 feet wide were made.

ST. LOUIS.

St. Louis, Kent county, is a closely built and rapidly growing village (exclusively settled by Acadian French), situated on the south bank of the Kouchibouguacis river, about 4 miles from its mouth where it enters the Gulf of St. Lawrence, and 7 miles northward from Richibucto, the shire town of the county ; it is the terminus of the Kent Northern Railway.

The Kouchibouguacis at St. Louis has a width of about 700 feet and is spanned by the highway bridge, a swing span in this admitting of the passage of vessels farther up the stream which is navigable for some miles.

The wharf, 200 feet long and 30 feet wide, is of round or open-faced crib-work. The top, having become decayed, the covering and stringers were removed ; the bays filled with brush, and weighted with stone. A new cap-timber was besides laid. The repairs contemplated were completed with the exception of some levelling of the stone, placing the fenders and gravelling the top.

The expenditure for 1900-1 was \$594.96.

Total expenditure to June 30, 1901, is \$2,670.11.

This work was transferred to control of Department of Marine and Fisheries on February 13, 1890.



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## ST. NICHOLAS RIVER.

St. Nicholas river wharf is situated in Kent county. The construction of a new wharf was begun in the spring of 1900, near the mouth of the St. Nicholas river (a tributary of the Richibucto), 4 or 5 miles below Main river,  $3\frac{1}{2}$  miles above Kingston, and 7 miles from Richibucto.

By the end of the fiscal year, the work, consisting of 3 blocks of round crib-work, composing a block and span wharf 159 feet in length, with a pier-head  $34 \times 24$  feet, standing in about 7 feet at low water, had been brought up to the under side of the stringers, fully ballasted, and partially fendered.

In 1900-1, the wharf was completed.

The expenditure for 1900-1 was \$806.52.

Total expenditure to June 30, 1901, is \$2,306.52.

This work was transferred to control of Department of Marine and Fisheries on August 6, 1901.

## SHIPPEGAN.

Shippegan Gully is situated in Gloucester county, fifty-six miles east of Bathurst used by fishing craft from Baie des Chaleurs to the Gulf of St. Lawrence, between Shippegan Island and the mainland. But for the shoal, two fathoms could be carried through this channel. The obstruction of the strait lies at the southern end and consists in a bar of littoral drift 800 yards wide, between the 12-foot contour lines, over which formerly only  $3\frac{1}{4}$  feet, but since the construction of the work undertaken by the department for the improvement of this passage, nearly  $6\frac{1}{2}$  feet are found at low water, equivalent to 12:3 feet at high water spring tides. The works at Shippegan are intended to preserve and deepen the channel between the sandy beaches by which access is given for the fishing boats to the sheltered waters of Shippegan harbour. As this channel is maintained by tidal scour, it is of the utmost importance that no other opening of any kind, than the navigable waterway, should occur in these beaches. Broadly speaking, the works consist of a pier at the point of each beach, and of breastworks running either continuously or intermittently along the beaches, to prevent their being cut through by the sea from the outside, or by the pent-up waters of Shippegan harbour from the inside.

From 1875 to 1890, the works were confined to the east side of the gully, and consisted principally of a short pier at the point and long breastworks along the face of the beach, the whole 1,220 feet in length, one-third being of crib-work and the remainder of brush and piling. In addition a dam, 890 feet long, also of pile and brushwork, was built near the junction of the east beach with the land, to prevent erosion.

In October, 1879, a storm, accompanied by an unusually high tide, seriously injured the dam; while the unfinished outer portion, 500 feet long, of the pier was destroyed and the inner part much damaged.

In 1880-1 and again in 1883, the dam was repaired, raised and strengthened; while in the latter year the pier was repaired and extended 120 feet.

General repairs were made again in 1883-4, also in 1886-7; while in 1888-9 an additional block of 50 feet was added to the outer end.

Until 1890-2 only one pier had been built, therefore no material improvement of the entrance could have been effected, but at that period a pile structure, 1,104 feet long ballasted with stone, was built at the point of the western beach. At the same time, a length of 137 feet of the work built in 1875 was reconstructed. On the construction of this work scour took place in consequence of the contraction of the waterway. The beaches, however, if not all over at least in places, are liable to be cut through

In 1892-3, and also in the following year, repairs were continued.

In 1897-8 general repairs to the works were begun, and efforts were made to elevate the beaches, by means of the natural forces, to a height sufficient to exclude



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the sea, to promote the growth of bent grass, and to prevent further denudation by the strong winds of that locality.

The east pier having been breached by the sea in three places, the west pier-head having been damaged and the west beach so denuded of sand by the wind as to become completely cut through, to the danger of the channel, the extensive repairs begun in 1897, were continued until the winter of the following year. By that time the dam had been raised 3 feet for a distance of 452 feet, and had been extended a distance of 185 feet, after a false channel 6 feet deep had been closed by a brush mattress 30 feet wide, and an apron of brush and stone 375 feet long had been applied to stop leaks in the original structure. On the northern side of the dam, ten rows of stakes or hand piles were driven in such manner as to form groynes, in order to give protection to the work by arresting the drift of seaweed and sand.

To prevent the traffic from wearing cartway into a runnel and causing a false channel through the eastern beach, it became necessary to raise the beach and to confine the cartway over this elevation to a single track. An inclined roadway 12 feet wide and 60 feet in length, raised  $2\frac{1}{2}$  to 3 feet above the level of the beach, was accordingly made of brush and shingle bordered with fascines. Four hurdles 155 feet in length were carried through the sand dunes on either side in order to restrict the traffic to the new way. A gap made in the sand dunes near this road was closed by a work of stakes, brush and shingle 46 feet long, 13 feet wide and 4 feet high. Near Fruing & Co's fishing establishment an opening on the harbour side of the beach was closed by 24 bents of piles, driven 5 feet apart, enclosing fascines, brush and stone. A further length of 119 feet was filled with brush and stone only.

A gap, originally 50 feet long, near the inner end of the east pier, was closed by driving 22 piles, to which were secured transverse caps and longitudinal walings, the whole being filled with brush and stone extending for a distance of 63 feet. Immediately adjoining this piling, a breach in the old work 22 feet long was rebuilt with fascines, brush and stone. Three hundred and twenty-five feet from the eastern pier-head, a breach in the old work, 62 feet long and 14 feet wide, was closed with piles, brush and stone, and faced with fascines. Immediately adjoining, another gap in the old pier, 70 feet long, was closed in the same manner. In the eastern pier-head a gap 90 feet long was closed by a block of close-faced crib-work, 45 feet long, and by pile and brushwork of the same length,  $33\frac{1}{2}$  feet wide. Some details of the pile and brushwork yet remain to be finished. A block of old crib-work inside these gaps was strengthened by driving piles along the inner face, connected by cross-walings and close-piling on the seaward side; the cap was renewed, and the top of the work levelled with brush and stone. The eastern pier-head was protected at the angle with close-piling, and received some ballast.

On the west side of the gully, 62 piles, generally 26 feet long, were driven at the pier-head; while for 180 feet the work was refilled with brush and stone. At the shore end of the west pier the covering was laid.

In order to raise the crest of the west beach, and so prevent the sea from forming false channels, a brush breastwork, 1,669 feet long, with hurdle groynes on either side at intervals of 40 feet, was carried from a point near the shore end of the west pier to the sand dunes.

In 1899-1900, with the exception of placing some stakes and brush on the west beach, repairs were confined to the eastern pier. The works before left unfinished were completed by the addition of covering, fenders, sheathing and ballast; a length of 455 feet of old work was rebuilt with fascines, brush and stone; a new pile groyne 26 feet long, and another of brush and stakes, 220 feet long, were constructed; additional brush and stone were applied to leveling up the works; two fences, intended to confine the cartway to one road (to prevent destruction of the bent grass), also to act as groynes, were erected on the east beach. At the dam, a length of 492 feet was raised generally a height of 3 feet with brush and stone; an apron, 476 feet long and 8 feet wide, was added to the face; an extension of 17 feet was made, ending in a



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groyne 175 feet in length, and an opening in the sand dunes was closed. The effect of the works undertaken since 1897 has been to prevent further erosion, and to cause restoration of the beach. It is, besides, reported that the depth of water in the harbour entrance has consequently increased.

The operations in 1900-1, besides checking the formation of false channels, comprehended the construction on the east side of the gully of a new pier-head, 44 feet long and 34 feet wide, formed of strongly-braced pile-work, brush, mattress and stone. This work was necessary for protection of the old crib-work pier-head, which has become undermined by the action of the sea.

A breastwork 200 feet long on the outside of the west beach, and another 92 feet long on the inside of the west beach, were built across a former false channel to increase the accumulation of sand. The old pier on the west side, which had been injured by ice at the outer end, and by scour at the inner end, was partly repaired by bolting 4½ streaks of 9 foot by 10 foot hardwood for a length of 190 feet; by inserting 40 diagonal braces, and by extending the inner end shoreward for a distance of 100 feet with hand-piles, stone and brush. A small runnel on the east beach was also closed.

The teredo has been found in the close-piling of the west pier.

The expenditure during the fiscal year was \$6,814.94.

Total expenditure to June 30, 1901, is \$80,389.37.

## TRACADIE.

Tracadie harbour, Gloucester county, is situated on the east coast of New Brunswick, about midway between Shippegan gully and the entrance into Miramichi bay, and is entered from the Gulf of St. Lawrence by what is known as the 'north,' 'south,' and 'old' gullies. The harbour is some six miles in length, by one-quarter to one mile or more in width, but, excepting in the river channels (north and south Tracadie rivers) and in the channels entering from the different gullies, is quite shoal, being almost dry at low water spring tides.

To provide wharfage facilities for the district, which is a large and populous one, containing fully 2,000 inhabitants, a public landing pier, 1,430 feet in length, extending to the end of the channel of the 'north gully,' was constructed during the fiscal year 1894, the materials therefor having been obtained during 1892-3.

The work consists of a stone abutment or approach, 250 feet in length, of 28 blocks, 20 by 25 feet, one block 40 by 25 feet, and 29 spans or openings of 20 feet each, which are spanned by 7 floor stringers 10 by 12 inches, the entire top of the work being covered with 3-inch planking. The blocks and the shore approach are built of round logs, open crib-work, and are fully ballasted, their sides being fendered, capped, &c.

During 1900-1, a crib-work block of 55 feet long and 27 feet wide on top, lying near the end of the wharf, was repaired, the upper works being rebuilt and connected with the main structure. In executing this work, 15 new cross-ties and as many stringers were placed; the top was covered with 3-inch spruce, and the sloping-face with 7-inch hard-wood sheathing; while the face and upper end of the block were fendered with spruce 10 inches square. Seven hemlock stringers were laid and the covering was extended over the interval between the new pier-head and the wharf. Sixty-five cubic yards of ballast were placed in the work. The top of the original wharf was also repaired, 487 lineal feet of new cap-timber being laid on the south side, and 286 lineal feet on the north side. Seventy-seven pieces of 3-inch planking were inserted in the covering, and 2-inch spruce planking was laid diagonally for some distance over the old top; five ring bolts were besides placed along the work.

The expenditure for the fiscal year was \$7,102.00.

Total expenditure to June 30, 1901, is \$6,318.38.

This work was transferred to control of Department of Marine and Fisheries on March 9, 1897.



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## TYNEMOUTH CREEK.

Tynemouth Creek, St. John county, 21 miles east of the city of St. John, is one of the several small havens, dry at low water, found on both shores of the Bay of Fundy, which are only useful on account of the high range of tide. Tides rise here about 28 feet. Inside of a beach of gravel and stones, is a tidal basin, accessible to small vessels at high water by an opening at the east end of the beach.

In 1874-5 the department built a substantial crib-work pier on the rocky foreshore of the eastern cliff to prevent vessels from taking ground on that side.

In 1882-3 another work to maintain the channel was built on the point of the beach on the opposite side.

In 1894-5 some of the fenders and covering of the east pier were renewed, and part of the rocky ledge obstructing the channel was removed.

In 1897-8, 813 cubic yards of shingle were removed from a shoal obstructing the entrance, and minor repairs were made to the west pier.

The harbour is formed by a long beach stretching from the western side of the inlet. By heavy gales the crest of the beach was cut down almost 5 feet for a length of 300 feet.

In 1900-1, to prevent this beach from extending and the harbour from being endangered, a protection work of piles and planks, from which 3 groynes, 41 feet long, projected, was built for a length of 345 feet.

At the crib-work groyne of the west pier, a block, 68 feet long and 16 feet wide, was repaired for a length of 52 feet; new ballast floors were inserted, ballast placed in, new stringers laid on top, part of the covering renewed, and ten new fenders put in. The remainder of the covering was also patched in places.

At the east pier, chocks were inserted between started face timbers to retain the ballast; 13 new fenders were placed, and the break was repaired at a cost of \$300.

Total expenditure to June 30, 1901, is \$7,533.07.

## WILSON'S BEACH.

At Wilson's Beach, a fishing settlement in a slight indentation of the coast, on the west side of Campobello, an island in the Bay of Fundy belonging to the county of Charlotte a breakwater 373 feet in length was built, to shelter the cove, by the joint contribution of the local and federal governments between the years 1874 and 1878.

The outer arm having become delapidated, and the cove having silted up, general repairs to the top and fenders of the inner end, 218 feet in length, were made, but not quite completed by the end of June, 1901. A large quantity of materials for entire reconstruction, in 1901-2, of the outer end in deeper water was also procured.

The expenditure during the fiscal year was \$14,457.15.

Total expenditure to June 30, 1901, is \$18,583.95.

## PROVINCE OF QUEBEC.

## ANSE À BEAUFILS.

Anse à Beaufils, in the municipality of Cape Cove, county of Gaspé, is situated on the Gulf of St. Lawrence, 6 miles south of Percé.

In 1898 work was begun with a view of improving the channel leading to a small basin which offers safe anchorage to fishing boats.

During the last fiscal year the sum of \$1,999.99 was expended in completing the improvements at the entrance to the river. The whole work, as completed, consists of



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round-timber crib-work and close-faced cribs; those are built on both sides of the stream. On the east side there are 457 feet of round-log protection wall, 14 feet high,  $16\frac{1}{2}$  feet wide at base and 14 feet at top, starting from the bridge on the public highway extending outward; to this is added 100 feet of close-face crib 20 feet wide and 18 feet high at end.

On the opposite side the round-timber wall is 347 feet long  $\times$   $10\frac{1}{2}$  to 14 feet wide, to which is also added an extension pier of 100 feet similar to the one on the east side; the whole crib is sheathed all over from top to bottom with 3-inch spruce deals on inside face.

Spring tides rise  $5\frac{1}{2}$ , neaps 3 feet.

Total expenditure to June 30, 1901, is \$8,450.55.

## ANSE AUX GASCONS.

The village of Anse aux Gascons, in the county of Bonaventure, is situated on the north shore of Baie des Chaleurs, in the municipality of Port Daniel East, 7 miles to the eastward of Port Daniel, and 42 miles west of Percé. The locality is considered one of the best fishing stations on the Baie des Chaleurs, the fleet consisting of over 60 boats in summer and 100 in the fall. The codfish catch averages from 4,000 to 5,000 quintals every season, beside which large quantities of salmon and lobsters are obtained. The bay is entirely open to southerly gales, against which it affords no protection. In order to inclose and protect an area, with sufficient depth of water at extreme low-water spring tides, to accommodate the largest class of fishing boats and trading vessels of moderate draught, a sum of \$5,000 was appropriated by parliament at its session of 1897, towards the construction of a breakwater 400 feet long and 20 feet wide. Tenders were called for the work, and on February 1, 1898, a contract was entered into for its construction for the bulk sum of \$11,494. The work was completed in 1899.

The structure is of close-faced crib-work, sheathed over the sea side and outer end face and 10 feet on return inside corner with 5-inch hardwood, extending down 14 feet.

The width at bottom is 24 feet, top 20 feet, height, outer end corner, 23 feet 10 inches to top of cap; total length outside on cap is 436 feet 6 inches (including an extra length over contract work of 36.6 feet).

During the last fiscal year the following repairs were made:—

Three hundred feet in length of the inside face was sheathed with 3-inch and 4-inch spruce deals 13 feet in length, well spiked. A large quantity of boulders were removed from the boat harbour and placed on the outside face of the breakwater, where the sea was undermining the structure; they were placed on a length of 125 feet, 5, 6 and 7 feet in height, and about the same in width. Some 106 feet of wharf had settled about 13 inches out of level, and ballast stone had gone down over 2 feet; the full length was levelled, filled and completed with birch sheathing to top.

Flooring was taken up on 325 feet, and ballast put in to top.

The whole structure is now as solid as a rock.

Spring tides rise 6 feet, neap tides 3 feet.

Expenditure during fiscal year is \$1,402.49.

Total expenditure to June 30, 1901, is \$14,204.06.

## BAIE ST. PAUL.

The village of Baie St. Paul, in the county of Charlevoix, with a population of about 1,400, is situated on the north shore of the St. Lawrence, 60 miles east of Quebec. It is built on either side of the River du Gouffre, which empties into a bay one mile and a quarter deep, and three miles wide at its entrance. With the exception of some small channels, the bay is dry at low tides.

In 1874-5 an isolated block 200 feet long and 25 feet wide, with a head 60 feet long and 50 feet wide, was built in 12 feet of water at low water, on the west side of the bay



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at a distance of 3,000 feet from shore at high tide and 600 feet at low tide. This block was built for the accommodation of lightships when taken to or removed from their mooring in the St. Lawrence, and was used by steamers as a landing pier. As it was not connected with the shore, the accommodation afforded to passengers and freight was so poor, that it was decided to build a landing pier on the east side of the bay, at Cap aux Corbeaux, three miles from the village.

During the last fiscal year some minor details and part of the flooring of the new shed at the end of the pier at Cap aux Corbeaux were completed. In the fall the space between the approach and the foot of the hill was filled for a length of 220 feet by 40 feet wide by 10 feet in depth, with fascines, stones and earth, so as to make it level with the surface of the wharf. The outside part of the approach was raised two and three feet and a side-walk 8 feet wide built along the raised part of the approach that is not floored with timber. A slip on the west side 110 feet long and reaching to 17 feet below the surface of the wharf was filled with crib-work, and 120 cubic yards of stone ballast put in. A movable slip 28 feet long, raised and lowered by means of chains, pulleys and winches, was built and placed on the western side of the head of the pier.

The pass and part of the western shore end was sheathed with rock maple, 8 inches by 10 inches. Two tiers of face timbers on the east side which were broken through had to be replaced, and the isolated block was repaired by replacing 17 tiers of face timbers on a length of 20 feet and by sheathing some 30 feet with hard-wood.

Spring tides rise 20 feet, neap tides 13 feet.

The expenditure during the fiscal year was \$2,000 for construction, and \$841.42 for repairs.

Total expenditure to June 30, 1901, is \$89,441.91.

#### BEAUPORT.

The village of Beauport, in the county of Quebec, is situated at the mouth of the river of the same name, on the north shore of the River St. Lawrence, two miles below the City of Quebec. It contains two large flour and grist mills, nail, match, grindstone, cement, lime and cotton factories, and the building stone, of which there are extensive quarries, is in great demand, large quantities of it being annually shipped. Spring tides rise 21 feet, neap tides 13 feet. At low water spring tides, the water of the St. Lawrence recedes about 3,700 feet from the mouth of the Beauport river.

During the last fiscal year the 200 foot extension to the wharf was completed. The work consisted in building up 8 feet high by 200 feet long, and 40 feet wide; all built of cedar and pine with some spruce on about one-third. The sheathing and planking are 3-inch pine deals.

There is now an area of 29,000 feet of wharfage accommodation at entrance of the river; the wharf frontage on west bank of river is 520 feet long.

The expenditure on this work amounts to \$4,494.75.

A further sum of \$1,008 was also expended in dredging the bed of the river, north of the wharf. The work served to widen the bed of the river, thereby affording better accommodation for the loading and unloading of coasting vessels of small draft. The west bank was cut down on a length of 425 feet from 3 to 8 feet deep, widening the channel from 12 to 35 feet extra, and by the removal of several big boulders, rocks and accumulated banks of stone, deposited for years past; the grounding of vessels at low tide has been made much safer.

Total expenditure to June 30, 1901, exclusive of dredging, is \$19,027.17.

This wharf was transferred to control of Department of Marine and Fisheries on October 19, 1891.

#### BERTHIER EN BAS.

The village of Berthier, in the county of Montmagny, is on the south shore of the St. Lawrence, 24 miles below Quebec.



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During the month of July of the last fiscal year, the repairs to the superstructure, commenced in June, were completed, the railings and posts were painted, two large fenders put in place, and two ladders built to replace the old ones.

During the months of September, October and November, a crib 100 feet long by 30 feet wide, and 40 feet high, was commenced on the east side of head of pier.

The work was resumed in May, and on the first of July a height of 30 feet was built and ballasted at a cost of \$6,574.91.

Spring tides rise 20 feet, neap tides 13 feet.

Total expenditure to June 30, 1901, is \$73,511.46.

This work was transferred to control of Department of Marine and Fisheries April 26, 1895.

## BIC.

Bic is an important village and summer resort, in the county of Rimouski, on the south shore of the St. Lawrence, 170 miles below Quebec. It contains a number of flour, saw and carding mills and two cheese factories.

During the past fiscal year, an addition 22 feet wide was commenced, starting from the north-east corner of the head of the old wharf and running in a westerly direction along the river a length of 93 feet on the outside and 70 feet on the inside.

The first crib, of irregular form, contains 278 cubic yards of crib-work and the outside crib, 23 x 22 feet, 243 cubic yards.

The work was done by day labour during the months of September, October, November and December, at a cost of \$1,541.39.

Spring tides rise 16 feet, neap tides 11 feet.

Total expenditure to June 30, 1901, is \$19,603.15.

## CACOUNA.

Cacouna, one of the favourite summer resorts of Canada, is an important village in the county of Temiscouata, on the south shore of the River St. Lawrence, 120 miles below Quebec.

A length of 305 feet, that could not be completed previously, was built during the months of July and August for the sum of \$907. Fenders 8 inches by 10 inches were placed on both sides with 3-inch spruce plank for the whole length. Two mooring posts were placed on the south side, and a hand railing on the north side.

Some minor repairs were done in September by day labour ; 6 mooring posts were put in and 275 feet of a hand guard-rail built. During the month of June, 300 feet of guard-rail was built. On the south side the movable stairway was replaced by a permanent one of close-face crib-work, and \$200 spent to purchase timber, iron and stone for the construction of a proposed addition.

The work was done by day labour, and the expenditure for the fiscal year was \$2,183.82.

Spring tides rise 19½ feet, neaps 9½ .

Total expenditures to June 30, 1901, is \$25,111.16.

## CAP SANTÉ.

The village of Cap Santé, the chief town of the county of Portneuf, is situated on the north shore of the St. Lawrence, 5 miles below Portneuf, and 31 miles above Quebec. At neap tides boats can only approach the landing pier when the water has risen to the height of 7 feet 9 inches, and even then only with risk, owing to the numerous boulders which are strewn along the foreshore of the river. The boulders form part of



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a reef which extends along the line of low water at a distance of about 1,100 feet from the head of the pier. The work of blasting the most dangerous boulder from the channel, leading to the pier, was commenced, in 1889, when a sum of \$252.43 was expended. The channel was further improved in 1890 at a cost of \$500.85. During the year 1898, a number of other boulders was blasted and removed, at a cost of \$423.49.

During the last fiscal year the extension block of 52 x 85 feet, commenced in June, 1900, was thoroughly completed, giving 80,973 cubic feet of close-face crib-work. The extension, built in front and adjoining the old wharf, purchased some time previously by the government, measures 85 feet frontage east and west by 52 feet deep, north and south; its height in front averages 17 feet, with a slope of 15 feet on west end, which leaves only 70 feet on top by 50 feet, this slope has been carried through the depth of the old wharf, 22 feet, the timbers of which were all rotten; the full length of 72 feet of slope being covered with 6-inch elm sheathing, and the south-west corners protected with boiler-plate. This slope proved very effective during the ice shove of last spring.

The old wharf, which was mostly rotten, was partly pulled up, rebuilt, ballasted, and graded on top. Wharfage space was increased by stone filling a large cavity in rear of old wharf, and the building of two retaining walls of dry stone, aggregating 80 x 3½ x 2½ feet, or 700 cubic feet. Three thousand four hundred and fifty-six cubic feet of sand and gravel were removed to locate foundations of new extension crib. Stone filling in rear of old wharf and grading of whole top amounted to 16,200 cubic feet.

Repairs and reconstruction of part of old wharf equalled some 10,321 cubic feet of work.

Spring tides rise 14½ feet, neap tides 8½ feet.

Expenditure during fiscal year, \$4,196.43.

Total expenditure to June 30, 1901, is \$10,773.81.

#### CAPUCINS.

Capucins, a village in Rimouski county, is situated 45 miles below Matane, and is known as a fishing and lumbering place.

The River Capucins, at its outlet, forms a large bay, that would have offered a very good and safe shelter to schooners and fishing boats, had it not been for the numerous large boulders scattered in the entrance.

These boulders were blasted and 225 cubic yards of rock were thus removed by day labour during the month of September, at a cost of \$200. The harbour can now be used at high tides with safety.

#### CARLETON.

Carleton is the most flourishing parish on the Baie des Chaleurs, in the county of Bonaventure, and 12 miles by water from Dalhousie, N.B.

The village is built on the shore of the Tracadigèche bay, at the foot of a mountain over 1,800 feet high, and is one of the most picturesque sites on the coast; it is already in great repute as a watering place.

The Carleton wharf, built in 1882-3, has a total length of 234 feet, including an outer end block of 39 x 39 feet, the inshore end of 195 feet is only 20 feet wide on top.

During the last fiscal year a contract was entered into for the construction of an extension 100 feet long; at the close of the year the work was well advanced.

Expenditure during fiscal year, \$7,399.22.

Total expenditure to June 30, 1901, is \$15,865.25.

This wharf was transferred to control of Department of Marine and Fisheries on April 27, 1889.



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## CEDARS (SOULANGES CANAL).

The village of Cedars in the county of Soulanges, is situated on the north shore of the River St. Lawrence, 15 miles east of Coteau Landing.

The construction of a wharf on the south side of the Soulanges canal, near the swing bridge at that place, was commenced in October last.

The wharf, a pile structure, has a length of 98 feet by a width of 30 feet, its outer face is 15 feet in height, and stands in 9 feet of water at the mean water level of the canal, the flooring of the wharf is even with the top of the bank; there is a store house 18 feet by 24.

The work was carried out by day labour, and was completed in June, 1901, at a cost of \$2,768.40.

## CHICOUTIMI.

The town of Chicoutimi, in the county of the same name, is situated on the south shore of the Saguenay river, 71½ miles above Tadousac, and at the head of navigation. The Richelieu and Ontario Navigation Company's boats call two to six times a week at the Chicoutimi pier, during the season of navigation, with passengers, freight and mails.

The landing pier is 245 feet long and 130 feet wide. It is 29 feet above the bottom of the river at its outer end, which stands in about 8 feet of water at low water spring tide.

During the past fiscal year a new 3-inch tamarack floor was laid on a length of 210 feet, and a width of 45 feet. The northern part of the wharf, for a length of 145 feet, was sheathed and the sheds were painted.

Spring tides rise 15 feet, neap tides 8 feet.

Expenditure during fiscal year, \$1,012.12.

Total expenditure to June 30, 1901, \$50,634.76, and \$170.50 for dredging.

## COTEAU DU LAC (SOULANGES CANAL).

The village of Coteau du Lac, in the county of Soulanges, in the province of Quebec, is situated on the north shore of the River St. Lawrence, thirty-six miles and a half above Montreal.

The construction of a wharf on the south side of the Soulanges canal, near the swing bridge at that place, was commenced in October last.

The wharf; a pile structure, has a length of 98 feet by a width of 30 feet; its outer face is 15 feet in height, and stands in 9 feet of water at the mean water level of the canal, the flooring of the wharf is even with the top of the bank; there is a store-house of 18 by 24 feet.

The work, carried out by day labour, was completed in June, 1901, at a cost of \$2,738.54.

## FATHER POINT.

Father Point, in the county of Rimouski, is on the south shore of the St. Lawrence, about 6½ miles from the village of Rimouski.

At the session of 1887 the sum of \$2,500 was voted for the purpose of recouping the expenditure of a survey made during the season of 1886, on account of a petition received from the Quebec Harbour Commissioners and others for the establishment of a harbour of refuge. The survey showed that it would require a pier 1,050 feet long to reach 20 feet depth at low water; and the Chief Engineer estimated the cost of the work at \$140,000. The present work, for which instructions were given in the last week in September, was delayed somewhat on account of the non-fulfilment of engagement to deliver the timber ordered.

The crib-work was started at 216 feet east from point 'A' or starting point of work. The rock foundation had to be blasted out and well levelled.



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A caisson, 100 feet long, 36 feet wide at the base and 8 feet high, was built from 216 feet to 116 feet from point 'A.' The whole was well anchored every 8 feet, as specified, to the rock foundation.

Three hundred and fifty nine feet of square timber and twelve hundred and fifty-four feet of round timber, together with three hundred cubic yards of stone ballast and five hundred and ninety bolts were left in store. The work was not resumed before July 1, 1901.

The work was done by day labour during the months of October and November at a cost of \$3,402.13.

#### GATINEAU RIVER.

The protection works along the east bank of the Gatineau river, made of piles and brush work, having suffered considerable damage by undermining, caused by the action of the swift current of the river, were for the most part carried away during the spring freshet of 1900. It was then found necessary to provide for works of a permanent nature, and an appropriation of \$7,300 was granted by parliament for this purpose. The new works consist in rebuilding the bank to its original line, where erosion has taken place, and rip-rapping its sloped face with quarry stone from the bottom of the stream to the top of the bank.

During the fiscal year, the bank, immediately above the C. P. Ry. bridge, for a distance of 223 feet, has been rebuilt and rip-rapped, and a portion of the bank, below the bridge, for a length of 112 feet, has also been rebuilt and protected in the same manner. This rip-rap is 18 inches thick, measures 59 and 55 feet respectively, across its sloping face of 1 in 1, and is built from the bottom of the stream to the top of the bank. These works will afford permanent protection to the banks.

The total amount expended on these works during the fiscal year was \$2,787.26.

#### GRAHAM.

Graham, a post village in the municipality of Como, is situated on the south shore of the Lake of Two Mountains, in the county of Vaudreuil, 13 miles west of Vaudreuil, and 4 miles east of Rigaud, it is a station on the Canadian Pacific Railway called 'Lavigne.'

Mr. William Graham, of the locality, owned an old wharf, which he transferred to the government, together with a right of way from the public road, at the foot of La Montée Ste. Marthe, to the wharf, a distance of 435 feet, by a width of 30 feet.

The wharf was so dilapidated that it had to be entirely rebuilt.

The new structure consists of the following, viz. :—

(a). A solid stone embankment 240 feet long, by a width of 24 feet at the top with slopes, each side, of one in one.

(b.) A pile work block head 98 feet long by a width of 33 feet.

(c.) A storehouse and waiting-room, 18 x 24 feet.

The work, carried out by day labour, was commenced in September, 1899, and was nearly completed in August, 1900. The wharf was open to the public in June of the same year.

The expenditure during the fiscal year was \$3,999.87.

The total expenditure on this work is \$5,125.63.

#### GRANDES BERGERONNES.

At Grandes Bergeronnes, 18 miles below Tadousac, in the county of Chicoutimi and Saguenay, the sum of \$203.12 was expended in cleaning the channel of the river for a distance of half a mile; the boulders removed therefrom were deposited on the banks of the river, 10 feet above high water mark.



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## GRANDE RIVIÈRE.

Grande Rivière, county of Gaspé, is situated on the coast of Gaspé, 21 miles south-west from Percé, and about 30 miles north-east of Port Daniel.

During the last fiscal year repairs to the extent of \$21 were made to freight-shed and waiting-room on the wharf.

Spring tides rise 6 feet 6 inches.

Total expenditure to June 30, 1901, is \$41,676.66.

This wharf was transferred to control of Department of Marine and Fisheries on July 6, 1892.

## GREECE'S POINT.

Greece's Point, in the county of Argenteuil, is a small post village, situated on the north shore of the River Ottawa, at the foot of the Grenville canal.

During the last fiscal year timber and stone were procured for the construction of a landing pier at that place, to the amount of \$1,953.70.

## HULL.

Hull, the shiretown of the county of Wright, is situated on the Ottawa river, opposite the City of Ottawa. It possesses unrivalled water-power privileges and contains a number of saw-mills, a pulp and paper manufacture, a match factory, &c., &c. Two large iron bridges span the river at this point, connecting it with the City of Ottawa. Population, 13,988.

The work of building a concrete and masonry wharf, on the Ottawa river, at the foot of St. Elizabeth street, was awarded by contract on October 30, 1900.

This wharf, when completed, will have a total length of 473 feet, and will consist 1st, of a landing block, 130 feet wide and 70 feet deep, built up to three different levels, and consisting of a crib-work superstructure up to the W.L., and a superstructure of concrete masonry walls, with filling between them; 2nd, an approach from shore to the landing block, also built up to three different levels, consisting of dry rubble masonry walls, with filling between. Owing to the lateness of the season in which the contract was awarded, only a portion of the dry walls, filling and crib-work substructure could be built during the fiscal year.

The expenditure on this work for the fiscal year amounts to \$9,865.12.

## ILE AUX COUDRES.

Ile aux Coudres, with a population of about 1,500, is in the county of Charlevoix, 62 miles east of Quebec, and  $1\frac{1}{2}$  miles from the north shore of the St. Lawrence, the upper end being opposite Baie St. Paul. The island is 9 miles long and 3 miles broad. It is divided into 65 farms, from which potatoes are the main produce.

During the past fiscal year some timber and 1,000 cubic yards of stone ballast for the proposed addition were procured.

Spring tides rise 20 feet, neap tides 13 feet.

Total expenditure to June 30, 1901, is \$9,385.38.

## ILE PERROT SOUTH.

Ile Perrot is an island in the county of Vaudreuil, at the confluence of the rivers Ottawa and St. Lawrence, and between the Lake of the Two Mountains and Lake St. Louis. This island divides the Ottawa into two branches.



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Both the Grand Trunk and the Canadian Pacific Railways cross the northern part of the island; but the nearest railway station to the parish and village of Ile Perrot, on the north shore of Lake St. Louis, are those of Vaudreuil and Ste. Anne de Bellevue. The population of the parish is 860. Trade, which consists of farm produce, is principally carried on with the city of Montreal.

In 1887-8-9 a public wharf was built on the south shore of the island, on Lake St. Louis, about  $1\frac{1}{2}$  miles below the parish church of the village of Ile Perrot. This wharf, as completed in 1889, is 611 feet long, and consists of : (a) a head block 120 feet by 30 feet, sunk in 8 feet depth at low water, with return 34 x 16 in the rear of the east end ; (b) nine cribs 24 feet wide, five being 20 feet long, and four 12 feet long, and which are placed at intervals of from 22 to 25 feet and connected by stringers and planking ; (c) a shore abutment or approach 182 feet long and 16 feet wide. A freight and shelter shed, 16 feet by 20 feet, has also been erected in connection with this wharf.

During the months of September and October, 1900, the following repairs were made to the wharf :—the renewing of the sheathing of the ice-breaker with tamarack 8 inches thick, of two-thirds of the flooring with 3-inch deals, of a number of 12 inch by 12 inch hemlock pieces decayed, and of 8 swingers also decayed. The guard railing was repaired and painted, and repairs were made to the approach, near the shore.

The work was carried out by day labour at a cost of \$876.04.

Total expenditure to June 30, 1901, is \$14,744.33.

#### ISLE VERTE.

The village of Isle Verte, the chief town of the county of Témiscouta, is situated on the south shore of the St. Lawrence, 16 miles below Rivière du Loup, and 131 miles east of Quebec. It has a population of 4,500, and contains flour, carding and saw-mills, and a carriage and threshing machine factories.

During the past fiscal year, a block of 40 feet by 50 feet, by 20 feet high, was constructed, on the west side of the head of the present pier, of close-face crib-work sheathed with 3-inch spruce and protected by 10-inch fenders of red birch. A new tier of longitudinals and cross-ties with a new 3-inch spruce flooring were placed on top of the old 40 by 50 foot block, which previously formed the head of the pier. A close shed of 20 by 30 feet, with a waiting-room and two freight apartments was built on new extension, well finished throughout and painted two coats, and some 300 planks on the approach had to be repaired or renewed. The work was done during the months of July, August, September and October by day labour at a cost of \$4,559.02.

Spring tides rise 19 feet, neap tides 12 feet.

Total expenditure to June 30, 1901, is \$27,159.05.

#### KAMOURASKA.

The village of Kamouraska is a favourite summer resort, situated on the south shore of the St. Lawrence, in the county of Kamouraska, 90 miles below Quebec.

During the past fiscal year, the pier was lengthened by an addition of 75 feet, starting with a width of 25 feet at end of old work, and widening to 45 feet with a height of 20 feet. The work was done by day labour at a cost of \$4,374.33.

Spring tides rise 19 feet, neap tides 12 feet.

Total expenditure to June 30, 1901, is \$21,470.96.

#### LAKE MEGANTIC.

Lake Megantic is about 73 miles south-east of Sherbrooke; length, 12 miles; average breadth, two to four miles with a coast line of over 36 miles. This lake and the rivers that run into it, form the head waters of the Chaudière river.



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*Lac Megantic* is a post village in Compton county on the Canadian Pacific Railway, 60 miles from Sherbrooke.

This wharf was repaired in 1889 ; again repaired and raised 4 feet in 1898

In 1900 an open shed, 20 x 30 feet, was built on the head of the pier, with a waiting room and small freight shed, and the whole was painted two coats, the work was done by day labour at a cost of \$302.08.

During the last fiscal year, part of the earth surface of the pier, that is 180 feet long by 22 feet wide, was raised 15 inches by day labour, during the months of September and October at a cost of \$346.75.

The total amount expended in repairing this pier since its construction, is \$2,766.33.

*Three Lake, or Flint's Landing* is situated at the head of Lake Megantic.

Three lake is, on account of the large number of tourists and sportsmen landing there, one of the most important landings of Lake Megantic.

The wharf first built in 1884-5 having been carried away, leaving nothing but the remnants of six old cribs below low water line, had to be rebuilt during the first half of the fiscal year.

The spaces between the old cribs were filled in by new cribs, 16 x 20 feet, and a new superstructure built up to 5 feet above low water level.

The pier is 16 feet wide, 240 feet long altogether, and the outer 20 feet has a width of 30 feet. The surface is finished with sand and gravel. The work was done by day labour during the months of September, October and November, at a cost of \$1,440.05.

Total expenditure to June 30, 1901, is \$3,632.50.

## WOBURN.

An open shed of 20 x 30 feet was built on the outside end of Woburn wharf with a small freight apartment. The whole was well finished and painted. The work was done by day labour at a cost of \$204.98.

## LES EBOULEMENTS.

The village of Les Eboulements, county of Charlevoix, with a population of about 900, is situated on the north shore of the St. Lawrence, 72 miles east of Quebec ; the place is somewhat frequented as a summer resort.

During the last fiscal year, the west side of the slip and 15 feet of birch and elm sheathing had to be renewed, fifteen hundred superficial feet of flooring with two tiers of longitudinals and cross-ties were renewed, and a centre walk four feet wide and 500 feet long, was placed in the centre of the pier for horses.

The whole was done by day labour during the months of October and November at a cost of \$444.72.

Spring tides rise 20 feet; neap tides, 13 feet.

Total expenditure to June 30, 1901, is \$95,366.68.

## L'ISLET.

The village of L'Islet, in the county of the same name, is on the south shore of the St. Lawrence, 47 miles below Quebec.

During the fiscal year 1900, the outer face of the head block was sheathed with 6-inch birch timber on a length of 115 feet and 14 feet high, some minor repairs were effected to the flooring and earth approach. The work was done by day labour during the months of May and June, at a cost of \$999.99.



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During the past fiscal year thirty feet of the eastern face of the head of the wharf was sheathed with 6-inch by 10-inch birch (red). The western slip side-walk and wheel guard were repaired.

The small landing pier 15 feet by 150 feet, that had been built on the west side of the shore end of the large wharf being found far too narrow had to be widened.

A crib 39 feet by 15 feet was built at the north-west corner of the old work, the ledge of rock on the north-east corner was blasted and the whole space between the new crib, the remaining part of the rock ledge, the main wharf and the old part of the spur or small wharf, was filled with rock, stones and earth, and well levelled throughout, thereby widening the wharf 39 feet on the whole length.

The work was done by day labour during the months of July, August and September, at a cost of \$975.34.

Total expenditure to June 30, 1901, is \$150,328.36.

Spring tides rise 20 feet ; neap tides, 13 feet.

This work was transferred to control of Department of Marine and Fisheries February 3, 1893.

LITTLE MATANE.

Little Matane, county of Rimouski, at the mouth of the Little River Matane, four miles east of the town of Matane.

During the first part of the last fiscal year the course of the river was straightened by cutting a channel through a ledge of shaly rock so as to allow fishermen's boats to seek refuge in the river basin. All the boulders and large stones that were a danger to boats coming in the bay were blasted and used, with the rest of the rock cut, to close up the old channel.

Two hundred and fifty cubic yards were thus removed by day labour during the months of September and October at a cost of \$302.06.

LOWER ST. LAWRENCE.

During the last fiscal year the following sums were expended for removal of rocks at the following places, to provide safer landings for fishing boats:—

Ste. Anne des Monts. . . . .	\$100 00
Petite Rivière Ste. Anne . . . . .	200 00
Petit Cap . . . . .	150 00
Griffin Cove, No. 1. . . . .	200 00
Griffin Cove, No. 2 (3 Ruisseaux). . . . .	100 00
Cap des Rosiers . . . . .	300 00
St. George de Malbaie . . . . .	50 00
Coin du banc et Cannes de Roche . . . . .	100 00
Cape Cove . . . . .	100 00
Petite Rivière Est . . . . .	100 00
Cap d'Espoir. . . . .	50 00
Brèche à Manon (Grande Rivière) . . . . .	50 00
Little Pabos. . . . .	50 00
Little Pabos. . . . .	25 00
Ste. Adelaide de Pabos . . . . .	100 00
Petite Rivière Ouest . . . . .	100 00
Grande Rivière. . . . .	100 00
Barachois de Malbaie. . . . .	50 00
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## MATANE.

The village of Matane, in the county of Rimouski, is situated on the south shore of the St. Lawrence, at the mouth of the Matane river, 240 miles below Quebec, and 30 miles by way of Little Metis from St. Octave, the nearest point on the Intercolonial Railway. It contains several saw and grist mills and a spool factory.

During the last fiscal year a caisson 150 feet long by 22 feet wide was built in extending the old inside wharf to serve as a guiding pier.

The caisson is 18 x 24 feet high; a good deal of difficulty was experienced to get down to good foundation. Repairs to the amount of \$80.72 had to be done to the old wharf.

The work was done by day labour during the months of September, October, November and December, and completed in June, 1901, at a cost of \$3,951.08.

Spring tides rise 14 feet, neap tides 6 feet.

Total expenditure to June 30, 1901, is \$34,911.85.

## MECHINS.

Two villages, called Little and Grand Mechins, Rimouski County, situated 35 miles below Matane, and populated mostly by fishermen and of men engaged in the lumber trade, especially the spool-wood industry, cover the coast from Grosses Roches to Capucins.

\$200.31 were spent during the months of September and October in removing 170 cubic yards of large boulders and 80 cubic yards of loose stones, so as to open the channel through a dangerous bar, and allow fishing boats and boats used in the loading of ships engaged in the exportation of lumber, to come to shore without running the danger of being wrecked.

\$103.23 were also spent during the month of October to remove 110 cubic yards of scattered boulders that had already caused the wreck of several fishing craft. These works were done by day labour.

Total cost, \$303.54.

## MONTREAL HARBOUR.

*Lower Division.*

During the summer of 1900 a contract was entered into with Messrs. Poupore & Malone for the construction of a high-level pier in the lower division of the Montreal harbour. At the end of the last fiscal year a large quantity of materials had been delivered, and the construction of the timber cribs, on which the concrete superstructure is to rest, had been commenced.

The expenditure during the fiscal year was \$49,296.45.

## MURRAY BAY.

Murray Bay, or Malbaie is one of the best known and most frequented summer resorts on the north shore of the St. Lawrence, in the county of Charlevoix, 83½ miles below Quebec. The village is situated on both sides of the mouth of the River Malbaie, which empties into a bay 1 mile deep and about 2½ miles wide at its entrance. At low tide the bay is dry, with the exception of small channels through which the river discharges. The steamers of the Richelieu and Ontario Navigation Company call daily, and a heavy traffic is done.

During the last fiscal year the head of the pier, with 75 feet of the outside end of the approach (that is a little over half of the whole surface of the pier) had to be



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demolished 5 feet down, and rebuilt with spruce and pine timber. Two iron rods and swivels had to be used to brace the work at the head of the pier. The corners were sheathed with rock elm, and 6,000 lineal feet of square timber was left over to be used in the fall. A good wheel-guard and a hand-rail were placed along the whole of the approach.

The whole was done by day labour, at a cost of \$5,170.31.

Spring tides rise 20 feet, neap tides 12 feet.

Total expenditure to June 30, 1901, is \$97,376.04.

This wharf was transferred to control of Department of Marine and Fisheries on August 15, 1893.

#### NEW CARLISLE.

New Carlisle, on the north shore of the Baie des Chaleurs, is the chief town of the county of Bonaventure, distant 65 miles from Campbellton, N.B.

A pier 606 feet long and from 29 feet to 49 feet wide, reaching 158 feet depth at low water springs, was built by the department, between 1881 and 1883, for general landing and shipping purposes. This work was much strengthened, partly re-filled with ballast, and otherwise improved during succeeding years, and in 1890-1, a head block was added, measuring  $51\frac{1}{2}$  feet in width at the inner, and 32 feet at the outer end, and 70 feet in length on an average, and having a depth of 16 to 17 feet along its outer face at low water spring tides.

During the last fiscal year the trestle work, at the shore end was built up at a cost of \$506.81, which completed the planking and renewal of the superstructure of the oldest portion of the wharf built previous to 1889.

Spring tides rise  $6\frac{1}{2}$  feet and neaps  $3\frac{1}{2}$  feet.

Total expenditure to June 30, 1901, is \$66,042.65.

#### NEWPORT.

The village of Newport,, in the county of Gaspé, is situated at the mouth of the river of the same name, on the north shore of the Baie des Chaleurs, 88 miles east of Campbellton, N.B., and 50 miles west of Caplan. Spring tides rise  $4\frac{1}{2}$  feet, neap tides  $2\frac{1}{2}$  feet. The population of the village is extensively engaged in fishing, which is carried on almost to the exclusion of all other pursuits.

In order to provide a harbour of refuge for fishing boats, and affording them easy access into the river and up to the bridge on the public highway, it was decided, in 1884, to improve the mouth of the river by excavating and the construction of suitable works. The works were not, however, completed until 1887, when a sum of \$2,778.79 was expended. They consisted of two parallel piers placed 20 feet apart; the west pier is 75 feet long, 12 feet wide, and of an average height of 8 feet; the east pier which was originally 140 feet long, 12 feet wide, and 10 feet high, was extended 90 feet and widened to 20 feet on its whole length, in 1889 and 1890, at a cost of \$3,672.03.

In 1891, general repairs were effected to the piers at a cost of \$450. During the year 1898 the sum of \$26.53 was expended for minor repairs.

During the fiscal year ended June 30, 1899, the sum of \$244.48 was spent in some small repairs to enable the fishermen to get through the season's fishing.

Material, iron, &c., were purchased in 1899-1900 for the construction of a proposed new breakwater.

During the last fiscal year the breakwater was commenced at a point called 'Les Isles.' It is built of close-faced crib-work with the following dimensions: length on top, 160 feet with bridgeway approach to shore, over rocky ridge, of 30 by 15 feet, built with 2-inch deals spiked on to beams or stringers. Length of structure at bottom is



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150 feet, average width 25 feet 9 inches ; total height at outer end to top of flooring is 16 feet, with  $4\frac{1}{2}$  feet water at low spring tides at outer end.

The cubic contents of the block are 52,195 feet.

Expenditure during fiscal year, \$4,655.29.

Total expenditure to June 30, 1901, is \$13,330.79.

## NOTRE DAME DU LAC.

Notre Dame du Lac, Temiscouata county, is situated on Lake Temiscouata about 50 miles south-east of Fraserville on the Temiscouata railway; the length of the lake is 29 miles, average width  $1\frac{1}{2}$  to 5 miles. It is the centre of a very important lumber industry and farming community.

Two small piers of open-face crib-work were built on Lake Temiscouata at Notre Dame du Lac during the months of October and November ; one on the west shore, opposite the church ground, having an approach or shore part of 72 feet long by 14 feet wide by  $8\frac{1}{2}$  feet high, and an outside block or head of  $23\frac{1}{2} \times 28\frac{1}{2}$  by  $11\frac{1}{2}$  feet high ; the other on the east shore, facing the church, at Dufour's landing, having an approach of  $61\frac{1}{2} \times 14$  feet by 8 feet high and a head or outside block of  $23\frac{1}{2} \times 28\frac{1}{2}$  by  $10\frac{1}{2}$  feet high. The whole was filled with stone ballast and the surface finished.

The amount expended on these piers was \$1,068.37.

## PERCÉ (NORTH BEACH).

Percé is the shiretown of the county of Gaspé; it is situated on the Gulf of St. Lawrence 36 miles from Gaspé basin. It consists of two small coves called North and South Beach. The principal part of the population reside at North Beach, which contains a Roman Catholic church and the court house and jail. The South Beach contains an Episcopal church and several fishing establishments. The far-famed Percé Rock is situated in close proximity to the shore. It is one of the most important fishing stations on the coast of Gaspé, and its population numbers about 2,500.

A breakwater, used also as a landing pier, was constructed in the South Beach in 1888 and 1889.

During the last fiscal year a contract was entered into for the construction of a landing pier in the North Beach, and at the close of the year the work was well under way.

Spring tides rise 5 feet 6 inches ; neap, 3 feet.

Expenditure for the fiscal year, \$4,167.85.

Total expenditure to June 30, 1901, is \$24,919.55, which includes cost of wharf in South Beach.

## PETITES BERGERONNES.

At Petites Bergeronnes, below Tadousac, in the county of Chicoutimi, the sum of \$308.25 was expended in removing boulders from the channel of the river, for a distance of three-quarters of a mile ; the boulders thus removed were deposited on the banks of the river, 10 feet above high water mark.

## PETIT METIS.

Petit Metis, a post village in Rimouski county on the River St. Lawrence, is a well known summer resort with a population of 500.

The stone approach to this wharf was built during the months of October and November, and measures from the starting point to the outside, 175 feet altogether,



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giving 150 feet built to grade of an average width of 22 feet, and a slope of 1 in 4. All the iron, some 600 cubic yards of stone ballast and small ballast floor timber were bought and held for future use.

The work was done by day labour at a cost of \$2,352.73.

## POINTE A VALOIS.

Pointe à Valois, county of Vaudreuil, is situated on the south shore of the Lake of Two Mountains,  $4\frac{1}{2}$  miles west of the village of Vaudreuil, which is the nearest railway station, and  $2\frac{1}{2}$  miles east of Como. In 1889-90 the old pier at this place, measuring about 80 feet by 16 feet, with head block of 45 feet by 20 feet, and the right of way to this pier, was purchased from Charles Valois for the sum of \$600.

During the fiscal years, 1890-1-2, the original pier was extended by adding, at the outer end, a block of ballasted crib-work 135 feet long, 21 feet wide, with a return to the eastward 55 feet by 25 feet; the total length of the work being thus increased to 225 feet. The depth of water available at the outer end of the wharf is now  $6\frac{1}{2}$  feet at low water.

During the fiscal year, 1896-7, a sum of \$210.77 was applied in effecting general repairs.

During the last fiscal year, 1900-1, more extensive repairs were made. They consist of the following:—

The prolongation of the stone embankment for a distance of 90 feet, the renewal of a number of swingers and all the flooring, and part of the front sheathing; also new guard railing and minor repairs at a cost of \$805.60.

The work was carried out by day labour. The wharf is now in good condition.

Expenditure to June 30, 1901, is \$6,066.93.

This wharf was transferred to the Department of Marine and Fisheries on October 6, 1897.

## RIMOUSKI.

Rimouski, an important watering place in the county of Rimouski, on the south shore of the St. Lawrence and the Intercolonial Railway, 180 miles from Quebec city. Population, 1,804.

The head of the Rimouski wharf, badly eaten by sea-worms and sunken down in places more than 2 feet, was very dangerous and rendered the transhipment of mails very difficult. An addition was built by contract to widen the wharf on the western side, which had opened and was demolished by the sea, leaving the stone ballast form a bad and very dangerous obstruction at the usual landing place of small mail boats.

In the past fiscal year, during the months of September and October, a diver brought up from the bottom, alongside of the wharf, 250 cubic yards of stone and prepared the foundations for a crib of 58 x 30 feet wide and 29 feet high; this was built so as to protect the old work and permit the construction of a shed to receive the mail bags. This new crib, with the reconstruction of the part demolished, made 2,200 cubic yards of crib-work. Five thousand and ninety feet of the surface of the wharf had to be floored, and one, and in places, 3 tiers of longitudinals and cross-ties had to be renewed.

During the months of May and June, 1901, the crib, commenced in the fall, was completed and sheathed on the outside face, and a shed, 110 feet by 27, was erected, but not quite completed before the end of the fiscal year. All material to complete the shed was bought and paid for.

This work was done by day labour at a cost of \$7,514.19.

Total expenditure to June 30, 1901, is \$149,860.66; and \$3,997.59 for dredging.

This wharf was transferred to control of Department of Marine and Fisheries on June 29, 1894.



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## RIVIÈRE À LA PIPE.

A small village, situated on the north shore of Lake St. John at the mouth of the river of the same name, 7 miles north of Grand Décharge.

It contains a Roman Catholic church, two saw-mills, one blacksmith shop and three stores.

The wharf is situated at a point on lot No. 118, township Taillon, about 1 mile to the westward of Rivière à la Pipe. It is built in a southerly direction, about 75 feet from shore, for a length of 200 feet and a width of 25 feet, and extends to 8 feet depth at the mean summer level of the lake. It was built of close-faced crib-work up to 18 feet, during the year 1897-8, and stands 25 feet high.

The wharf will facilitate communication between the northern and southern shores of the lake, which is rendered difficult, not only on account of the distances being great by land, but by the state of the roads, or the entire absence of such. The large rivers which flow through the township and territories around Lake St. John also intercept all means of communication and prevent, to a certain extent, settlement of the lands.

The Quebec government has built a good road from the public road to the present wharf, a distance of 2 miles.

In 1899 an addition 50 feet long by 30 feet wide was built at the outer end of the wharf to facilitate the approach.

In 1899-1900 the outer block was raised 5 feet, sheathed for a length of 120 feet and replanked. Twenty-five toises of stone was also placed in the work.

During the past fiscal year the wharf was completed by the construction of a pier, at the outer end, 50 feet long and 25 feet wide, which now gives to the wharf a total length of 500 feet. This pier was sheathed with 6-inch tamarack, 30 fender piles were placed around the wharf, and the planking was completed with 3-inch tamarack deals.

Expenditure for the fiscal year, \$999.08.

Total expenditure to June 30, 1901, is \$9,496.15.

## RIVIÈRE AU RENARD.

Rivière au Renard is one of the most ancient settlements in the county of Gaspé. It is the first important fishing station and business place met with, proceeding from Gaspé basin along the south shore up the St. Lawrence. The population is estimated at 1,700.

A small landing pier was constructed in 1895-6.

In 1899-1900 the sum of \$2,870.51 was expended for materials, such as timber, iron, plant and tools, freight, &c., towards the construction of a landing pier and break-water.

During the last fiscal year the sum of \$2,013.36 was expended in purchasing additional timber.

Work was started in May, and on June 30, 190 feet of close-faced crib-work, 5½ feet high, 28 feet wide at bottom and fully ballasted, was in place.

Total expenditure to June 30, 1901, is \$5,414.33.

## RIVIÈRE CAP DE CHATTE.

Cap de Chatte, is situated on the St. Lawrence, at the extreme western end of the county of Gaspé. In 1898-9, a training pier was constructed along the upper side of the channel, followed by the River Cap de Chatte, across the foreshore of the Gulf of St. Lawrence.

The object of this pier was to facilitate the passage of vessels to and from the basin, inside the mouth of the river, and to prolong the time of vessels remaining afloat in the basin and engaged in loading and unloading and by inducing a scour which will



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deepen the river channel near its outlet into the gulf, where its bed stands considerably higher than farther inland.

Its general dimensions are, total length, 368 feet ; average height, 14 feet ; average width, 21 feet ; width on top, 20 feet.

The west elevation stands on dry ground at low water, while the side facing on the river is 300 feet. The structure is completely finished of close-faced crib-work of 12-inch by 12-inch spruce and cedar in upper works, filled with stone ballast.

During the last fiscal year, a further length of 100 feet was added to the training pier connecting it with the shore, where its height is 3 feet, and average width 18 feet. In the course of last year the outer end of the block (of 368 feet previously built) had settled irregularly on a length of 225 feet.

Expenditure during fiscal year \$830.79.

Total expenditure to June 30, 1901, is \$6,331.95.

#### RIVIÈRE DES VASES.

Rivière des Vases is in the county of Témiscouata, 125 miles below Quebec, and 6 miles west of the parish of Isle Verte.

The entrance of this small river has always been used as a harbouring place by the 100 families living on the island opposite, and since the sea-grass industry has started, is used by those who are engaged in the industry that is growing every year.

An open-face crib-work was built along the eastern bank of the river for a length of 100 feet, 30 feet wide and 8 feet high on the outside face, and completed, with the exception of 25 feet by 30 feet at the lower end, that was left 3 feet lower than the other 75 feet.

The whole is filled with stone and the surface finished with gravel and sand. The work was done by day labour during the month of September, at a cost of \$499.63.

#### RIVIÈRE DU LIÈVRE.

Rivière du Lièvre, county of Labelle, empties into the Ottawa, 25 miles below the city of Ottawa, at Buckingham. In the month of April, 1900, a land-slide occurred from the east bank of the river, about one mile below the lock at Little Rapid. The land-slide extended over a length of 300 feet parallel with the river, 200 feet deep inland, and 12 feet high, the land which fell in was covered with trees and completely obstructed the waterway for a short time, until a new channel was scoured out in the west bank of the river but not sufficiently deep for the draft of the steamer frequenting the locality. The removal of trees and earth from the old channel was commenced on May 27, and by the middle of August a channel had been made 60 feet wide with 6 feet of water.

The work was done by day labour at a cost of \$2,259.05.

#### RIVIÈRE DU SUD.

The town of Montmagny, in the county of the same name, is situated on the north shore of the St. Lawrence, on the Intercolonial Railway, 40 miles below Quebec. The Rivière du Sud flows through the centre of the town.

A length of 130 feet of masonry 6 feet high and 7 feet wide was built to continue the protection wall already constructed on the eastern bank of the Rivière du Sud.

The top of the old wall had to be repaired in several places, as the ice had lifted and thrown out some of the coping stones. The work was done by day labour at a cost of \$1,438.64.



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## RIVIÈRE OUELLE.

The pier is situated at Pointe aux Orignaux, four and one-half miles from the village of Rivière Ouelle, Kamouraska county. It is substantially built throughout of crib-work filled with stone ballast, and is 1,350 feet long, of a uniform width of 28 feet, apart from its outer end, 51 feet which is  $237\frac{1}{2}$  feet wide. The head is 42 feet above the bottom of the river and stands in 10 feet of water at low water spring tides. The pier was completed in 1858. In 1875 a lighthouse was erected on the head of the pier by the Department of Marine and Fisheries.

During the past fiscal year, the west and east slips were repaired and 2,200 superficial feet of flooring, together with one and two tiers of longitudinals and cross-ties, renewed. The work was done during the months of November and December by day labour at a cost of \$288.16.

Total expenditure to June 30, 1901, is \$261,133.25.

This work was transferred to control of Department of Marine and Fisheries September 28, 1892.

## RIVER RICHELIEU, BOOM AT BELCIEL.

In order to give needed protection to boats passing through the swing span of the Grand Trunk Railway bridge at Belœil, counties of Chambly and Verchères, a boom and pier were constructed.

The boom, situated on the west side of the Richelieu river, north of the Grand Trunk Railway bridge, has a length of 100 feet by a width of 4 feet. It is moored at its south end to the Grand Trunk pier, at its north end to the wharf of Mr. F. Pariseau, and at the centre to a pier constructed for that purpose.

The boom stands in four feet of water at extreme low water level and in 16 feet at extreme high water level.

The work, carried out by day labour, was commenced in January, 1901, and completed in April of the same year at a cost of \$757.19.

## RIVER RICHELIEU BOOM AT ST. JOHNS.

In order to give valuable assistance to boats passing through the swing span of the Vermont Central Railway bridge at St. Johns, counties of St. Johns and Iberville, a boom was constructed.

The boom has a length of 350 feet by a width of four feet, and is moored to clusters of six piles each, driven 15 feet into the ground at every 50 feet, except the up stream cluster, which has ten piles, and is protected against the ice by a steel plate, 6 feet by 6 feet by 7-16 inches. The piles of each cluster are well secured together by screwed bolts.

The boom stands in nine feet of water at extreme low water level, and in 14 feet at extreme high water level.

The timber used is 12-inch x 12-inch hemlock for the boom, and round pine and oak, 14 inches at butt end, for the piles.

The work, carried out by day labour, was commenced in November, 1900, and completed in April, 1901, at a cost of \$1,504.45. The boom was not affected by the ice last spring, and has given general satisfaction to navigation.

## ROBERVAL.

*Roberval.*—This village, in Chicoutimi county, is built on the east bank of River Ouïatchouanish, near its mouth on the southern shore of Lake St. John, 200 miles north-east of Quebec city, and is the northern terminus of the Roberval branch of the



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Quebec and Lake St. John Railway, which taps the main line at Metabetchouan station.

This place contains three churches, three hotels, four saw-mills, two grist-mills, four cheese factories, telegraph and express offices, and some 14 stores. It is a favourite resort for sportsmen and tourists generally in the summer season, when five steamers leave the government wharf daily, carrying freight and passengers to and from important settlements, as well as on pleasure excursions undertaken for the special benefit of the large number of people who visit the Lake St. John region every day.

The wharf, which was destroyed by fire in 1899, was rebuilt for a length of 500 feet, with a width of 30 feet and a height of 23. The face timbers are of spruce, 11 x 11 inches, and the cross-ties, of the same wood, are 10 inches in diameter at the small end. A waiting room, 14 x 18 feet, and a freight shed, 15 x 28 feet, have been erected on the wharf.

The expenditure for the fiscal year amounts to \$9,747.82.

Total expenditure to June 30, 1901, is \$21,073.13.

#### SABREVOIS.

The parish of Ste. Anne de Sabrevois, in the county of Iberville, is situated on the east shore of the River Richelieu, 7 miles from Iberville and 6 miles from St. Alexandre, on the Canadian Pacific Railway. It is a station of the East Richelieu valley Railway. It has the largest creamery in the province of Quebec, two cheese factories, one hotel, three stores, one door and sash factory, one post and telegraph office, and two churches, one Roman Catholic and one Protestant.

In order to better accommodate the traffic by water way to and from this place, an old wharf together with a right of way from the public road to the river, a distance of 1,372 feet by a width of 30 feet, was purchased from Mr. Wm. Ryan, for the sum of \$500. As the old wharf was dilapidated a new wharf was built in its place.

The new structure consists of the following, viz. :—

(a.) A stone embankment 200 feet long by 20 feet wide, with slopes 1 in 1.

(b.) A trestle approach 120 feet long, 24 feet wide.

(c.) A head block of pile work 108 feet long, parallel to the channel, by a depth of 30 feet, with an ice-breaker, at its up stream end, of solid crib-work.

The work, carried out by day labour, was commenced in February, 1900, at the end of the fiscal year the sum expended was \$4,482.94.

The work was continued during the next fiscal year, and completed in November, 1900, at a total cost of \$6,573.70.

#### ST. ALEXIS.

St. Alexis is on the south side of Ha Ha bay, River Saguenay, about 63 miles from its mouth.

In order to accommodate the increasing traffic of the locality and afford landing facilities for steamers frequenting the River Saguenay, the sum of \$4,000 was appropriated at the session of parliament of 1898 for the construction of an isolated pier at a short distance from the shore. The pier was built during the year and is 60 feet long, 30 feet wide, and 39 feet high, the outer end being in 13 feet of water at low water spring tides; the outer end is at a distance of 700 feet from the shore.

The pier is built of square timber, filled with stone ballast and sheathed with 5-inch tamarack.

In 1899-1900, two blocks, 75 feet in length by 25 feet in width, and 25 feet apart were built and filled with stone then connected by spans. The outer block was sheathed with 5-inch tamarack at a cost of \$3,999.



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During the past fiscal year an addition, of 250 feet long and 25 feet wide, was built, tamarack and pine timber being used in this construction. The planking is of 3-inch tamarack.

Expenditure for fiscal year, \$4,016.63.

Total expenditure to June 30, 1901. \$12,102.69.

## ST. ANDRÉ.

The village of St. André, situated 100 miles below Quebec, on the south shore of the St. Lawrence, in the county of Kamouraska, is a summer resort and an important industrial centre.

During the past fiscal year, 600 cubic yards of material were placed on the east side of the earth approach. All this new work, with part of the old, was carried away by a heavy storm and had to be gone over again. A crib, 25 by 25 feet by 15 feet high was built 22 feet out from end of wharf. No fenders, sheathing nor flooring have been put in place. The work was done during the months of October, November and December at a cost of \$4,048.79.

Spring tides rise 19 feet, neap tides 12 feet.

## STE. ANNE DU SAGUENAY.

The parish of Ste. Anne du Saugenay is situated on the north shore of the Saguenay river, 72½ miles above Tadousac, and opposite the town of Chicoutimi. Its population is over 2,000. Besides the church and post-office, the parish contains seven stores, four cheese factories, a lime kiln, a brick-yard and a pottery. The only market for the produce of the farms of this section of the north shore of the river is Chicoutimi.

During the past fiscal year, the sum of \$2,507.36 was expended in renewing the planking of the wharf over a length of 240 feet and a width of 25 feet. The upper part of the wharf was sheathed over a length of 110 feet, with 6-inch tamarack, and a shed, 45 feet by 30 feet, was also erected on the wharf.

Spring tides rise 15 feet, neap tides 8 feet.

Total expenditure to June 30, 1901, \$25,001.73.

## STE. ANNE DE LA PÉRADE.

Ste. Anne de la Pérade, in the county of Champlain, is situated on the north shore of the River St. Lawrence, 53 miles above Quebec. The River Ste. Anne, one of the tributaries of the St. Lawrence, divides the village.

At the session of 1894 a sum of \$10,000 was voted for the protection of the village, the municipality having subscribed the sum of \$5,000.

The proposed works were done during the winter of 1895, and consisted of five dykes.

The dykes are : No. 1, 140 ; No. 3, 340, and No. 4, 435 feet in length, respectively; the fifth, near the Canadian Pacific Railway bridge, is 340 feet in length, and that of the little channel on the west side of the river is 550 feet in length.

These dykes consist of two rows of piles driven 10 feet apart, and filled with brush loaded down with stone.

It is to be remarked that the soil, where piles have been driven, is a fine sand taken down by the river from the landslide at St. Albans, the bed of the river having been raised 6 feet at Ste. Anne.

A sum of \$14,906.05 was expended during the year 1895.

During the fall of 1895 work was executed for the removal of trees, stumps, &c., accumulated in the little channel owing to the landslide at St. Albans.



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During the winter of 1896 dyke No. 1 was reconstructed for a length of 220 feet, and No. 5 was repaired. These dykes experienced considerable damage by the breaking of the ice in December, 1895.

During the months of November and December, 1900, and January, 1901, some repairs were done to dykes Nos. 1 and 2, and a round-timber crib-work, with an under bed of brush, the whole loaded with stone, was constructed for a length of 400 feet by a width of 10 feet and a height of 8 feet, from the foot of dyke No. 1 to the shore.

The object of that work was to protect the dykes Nos. 1 and 2, which were liable to be carried away, or, at least, seriously damaged by freshets, owing to a wash-out from the foot of dyke No. 1 to the shore of about 60 feet wide, and to prevent a landslide opposite the dykes.

It has proven its utility during the late freshets, when no damage was caused.

The work was done by day labour at a cost of \$1,199.21.

Total expenditure to June 30, 1901, \$52,830.02 ; and \$13,970.33 for dredging.

#### STE ANNE DE LA POCATIÈRE.

The village of Ste. Anne de la Pocatière, in the county of Kamouraska, is situated on the south shore of the St. Lawrence, 75 miles below Quebec.

During the past fiscal year the stone and earth approach was repaired and some 35 planks (3-inch) renewed. One, and in places two tiers of timber were added to complete the outside crib of 30 x 30 feet at outer end of wharf. This crib, together with an open space between cribs of 20 feet x 30 feet, were floored with 3-inch spruce planks.

A new crib of 30 x 30 feet and 14 feet high was built 20 feet out from the 30 x 30 foot crib already mentioned, so as to serve for the present as a breakwater and protect schooners moored at the head of this wharf.

The work was done by day labour, during the months of October and November, at a cost of \$999.67.

Spring tides rise 20 feet, neap tides 13 feet.

Total expenditure to June 30, 1901, is \$11,876.99.

#### STE. EMILIE.

Ste. Emilie is a village in the county of Lotbinière. The post office name is Leclercville. It is situated on the south shore of the St. Lawrence river, 50 miles above Quebec.

The village is at the mouth of the Great River du Chêne, and the site of an extensive lumber mill.

As the nearest railway station is distant six miles, the summer means of communication and trade is by boat.

There has never been a public landing wharf. The practice has been to lighter passengers and freight to and from the market boats by means of a scow.

This was dangerous in bad weather and inconvenient.

An appropriation of \$3,000 having been made for the construction of a public wharf, work was commenced in August, 1900, by day labour.

The wharf was made an isolated block, designed to stand heavy ice action ; communication with the shore to be by means of a trestle approach, removable in winter.

The dimensions were : 53 feet long and 25 feet wide on top, and 19 feet high, with an ice batter on the up stream end and inshore face.

The supplemental estimates gave a further amount of \$2,000.

The work was completed in July, 1901, at a cost, including the approach, of \$4,843.91.



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## ST. FULGENCE.

St. Fulgence (otherwise called l'Anse aux Foins) is a small village in Chicoutimi county, on the north shore of the Saguenay river, 10 miles from Chicoutimi. It contains one Roman Catholic church, four stores and two saw-mills. Population of parish 1,000.

In 1897-8 the department commenced the construction of an isolated block of close-faced crib-work to enable schooners and steamers of the Richelieu and Ontario Navigation Co. to land and ship freight and passengers at all times. This block is 60 feet long and 30 feet wide, and was built during the year to an elevation of 20 feet from the bed of the river. The block is sunk in 10 feet of water at low water spring tides at a distance of about 2,500 feet out from the shore at high water mark.

During the fiscal year 1899 the pier was raised 5 feet and the sides sheathed over a length of 90 feet, and 15 toises of stone ballast were placed in the pier.

In the winter of 1899 the isolated block was damaged by ice and to prevent a recurrence, a talus of stone 30 feet long by 17 feet high was built; the block was raised 3 feet and the south side was resheathed with 5-inch tamarack.

Spring tides rise 20 feet; neaps, 13 feet.

During the last fiscal year the isolated block was sheathed with 6-inch tamarack, 16 fender piles were put on, and the entire surface, 60 feet by 30 feet, was planked at a cost of \$1,500.02.

Total expenditure to June 30, 1901, \$6,994.25.

## ST. JÉRÔME.

St. Jérôme, county of Chicoutimi, is a village situated on the south bank of Lake St. John, 24 miles east of Roberval.

The wharf, commenced in 1899, consists of an approach 75 feet in length, 25 in width and 15 in height, filled with stone ballast, sand, &c.; two outer blocks 75 feet in length by 20 feet in width, with 25 foot spans between, which are connected by stringers and planking. The whole length of 275 feet was planked, 6 snubbing posts were placed, &c., at a cost of \$4,990.28.

During the last fiscal year an addition 400 feet long, 25 feet wide and 24 feet high was built; it was sheathed with 6-inch tamarack and filled in with stone; 50 fender piles were also placed around the wharf.

Expenditure during fiscal year was \$6,933.90.

Total expenditure to June 30, 1901, is \$11,933.18.

## STE. IRÉNÉE.

The village of Ste. Irénée is situated on the north shore of the St. Lawrence, in the county of Charlevoix, 78 miles below Quebec and 5 miles west of Murray Bay. It contains one cheese factory, two grist-mills, and four saw-mills.

During the last fiscal year the winches, having been upset and badly broken during storm, had to be repaired and bolted down to a good foundation and painted two coats; one beam of the slip had to be repaired and the other replaced.

The approach, half carried away by a storm in May, was rebuilt and filled with stones and gravel at a cost of \$15.

The whole was done by day labour.

Spring tides rise 19 feet, neap tides, 12 feet.

Total expenditure to June 30, 1901, is \$26,351.27.

This work was transferred to control of Department of Marine and Fisheries on May 29, 1891.



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## ST. LAMBERT.

The town of St. Lambert is situated on the south shore of the St. Lawrence, directly opposite Montreal, in the county of Chambly and Verchères, district of Montreal. Population about 1,500.

The Victoria Jubilee bridge spans the St. Lawrence here, and all trains to and from the city stop at the railway station. Several lines of railway run here, viz.:—Grand Trunk, Central Vermont, Delaware and Hudson, and Montreal and Sorel. There are four churches: Methodist, Episcopal, Roman Catholic and Presbyterian, with resident ministers and curé.

A system of water supply and drainage has been inaugurated.

In order to protect the bank of the river opposite the town against damages caused by the ice during the spring floods, it was decided to build a protection wall 800 feet long.

The work was commenced in October, 1900, and in February, 1901, 310 feet were completed.

It is a solid crib-work structure 20 feet wide at the base, set at one foot above the low water level, 5 feet wide at the top, with a slope one in one and 20 feet high.

The slope is sheathed with tamarack 8 inches thick, the top is covered with hemlock 6 inches thick; the space between the protection wall and the top of the bank is filled in with stone, and so is the whole structure.

The work was done by day labour at a cost of \$9,993.05.

## ST. LAURENT.

St. Laurent, county of Montmorency, is situated on the south shore of the Island of Orleans, 10 miles east of Quebec; the place is somewhat frequented as a summer resort.

During the first part of the last fiscal year the superstructure of the shore end of the pier for a length of 80 feet was renewed and completed for a height of 6 to 8 feet.

In September, October and November, the outside end of the pier, which was badly rotten and going to pieces, had to be demolished and rebuilt in cedar. A length of 60 feet by 60 wide and 8 feet high had thus to be renewed. Only 25 feet was completed by the end of the fiscal year. The work was done by day labour at a cost of \$1,607.36.

Spring tides rise 20 feet high, neap tides 13 feet

Total expenditure to June 30, 1901, is \$20,513.58.

This pier was transferred to control of Department of Marine and Fisheries on August 25, 1894.

## ST. MATHIAS.

St. Mathias, in the county of Rouville, is situated on the south side of the River Richelieu.

It had been decided to build a landing pier at that place, but owing to some difficulty in the purchase of the right of way, nothing was done during the past fiscal year, excepting the purchase of a quantity of timber that was procured at a cost of \$1,073.55.

The work will be carried out during the next fiscal year.

## ST. MICHEL DE BELLECHASSE.

St. Michel de Bellechasse is on the south shore of the St. Lawrence, 15 miles below Quebec, in the county of Bellechasse. The place is somewhat frequented as a summer resort.



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During the past fiscal year 366 feet in length by 10 feet wide, and 6 feet high of the eastern side of the pier was demolished and rebuilt in cedar, by day labour at a cost of \$1,003.48.

Spring tides rise 20 feet, neap tides 13 feet.

Total expenditure to June 30, 1901, is \$24,479.87, and \$13,246.92 for dredging.

## ST. ROCH DES AULNAIES.

St. Roch des Aulnaies is situated on the south shore of the St. Lawrence, in the county of L'Islet, 70 miles below Quebec.

In order to facilitate the loading and unloading of schooners carrying the freight of the locality, a sum of \$5,000 was voted by parliament at its session of 1899 for the construction of a pier, and in the month of June of the same year a contract was entered into for its construction for the bulk sum of \$6,087.

The work consists of a stone approach 230 feet long, 15 feet wide at top, of a mean height of 10 feet, and built to a slope of 1 in 1 at the sides; thence in a westerly direction, parallel to the shore, of a block of close-faced crib-work 150 feet long, forming an 'L' with stone approach, which afford shelter for schooners inside the bay; the crib-work is 20 feet wide at the top, with a batter of 1 in 12 at the sides; at high water spring tides a depth of 14 feet 8 inches is found at the head of the pier.

The work was not completed at the end of the fiscal year.

Spring tides rise 18 feet, neap tides 12 feet.

The expenditure during the fiscal year was \$2,443.15.

Total expenditure to June 30, 1901, is \$6,771.23.

## TADOUSAC (ANSE À L'EAU).

Tadousac, the *chef-lieu* of Saguenay county, is a watering place on the north-eastern side of the Saguenay river, about 5 miles above its mouth and is much frequented by tourists and health seekers during the summer season. The village contains three churches, one of which is the oldest church built in Canada, being erected in 1747, four hotels and stores, a telegraph office, a post office and many handsome villas; a fish hatchery has also been established here by the Department of Marine and Fisheries. Population of village about 900, of parish, 2,440.

During the last fiscal year the approaches to the wharf, 600 feet long, have been entirely renewed, the foundations are of cedar, while the flooring is of tamarack.

Expenditure for fiscal year was \$2,053.37.

Total expenditure to June 30, 1901, is \$17,009.43.

This work was transferred to the control of the Department of Marine and Fisheries on July 20, 1895.

## PROVINCE OF ONTARIO.

## BEAVERTON.

Beaverton is situated at the mouth of the Beaver river, on the east shore of Lake Simcoe, in the county of Ontario. It is a station on the Midland division of the Grand Trunk Railway, about 70 miles from Toronto. Population, 1,000.

The following is the structure connected with this harbour :—

Landing pier, 1,135 feet in length, consisting of a stone rip-rap approach 235 feet long filled with gravel, and 840 feet composed of 18 fully ballasted cribs 20 by 20 feet,



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with spaces between same 25 feet, and an outer 'L' crib 60 by 30 feet, the whole of the work connected with stringers and plank covering. The work stands 3 feet 4 inches above low water level, and the depth slopes from the shore to 7 feet at the outer end.

Breakwater, 320 feet in length, 10 feet wide, of ballasted cribs only standing one foot above low water on east side of the mouth of the river.

The structure is in a fair state of repair.

Authority was given on August 9, 1900, to expend the sum of \$1,000 in effecting repairs to the landing pier. Work was commenced in June, 1901, and completed in the same month.

In making the repairs, which consisted chiefly in replanking the decks of the piers, the following materials were used: 46,754 feet B.M. cedar, 3,450 feet B.M. elm, and 250 lbs. iron spikes and nails.

Total expenditure to June 30, 1901, \$10,985.70.

#### BOWMANVILLE.

Bowmanville, or Port Darlington, is situated on the north shore of Lake Ontario, county of Durham, 43 miles from Toronto by rail on the Grand Trunk division of the main line between Toronto and Montreal. Population, 2,731.

The following are the several structures at this place :—

Landing pier, east side of harbour, 1,500 feet in length. The outer end is 70 feet, and the inner end 30 feet wide, and stands 6 feet above and from 20 to 22 feet below low water.

This structure is built of cribs fully ballasted with stone, and continuous timber superstructure, decked over, with close sheet piling on channel side.

Breakwater, west side, 1,200 feet in length, the outer end is 40 feet, and the inner end 20 feet wide, and stands 5 feet above, and from 20 to 22 feet below low water. This structure is built of cribs, filled with stone ballast, and continuous superstructure.

The landing pier is in a thorough state of repair, but the breakwater shows that about 200 feet is very rotten above low water, and much stone is required to refill the cribs. There is a depth of 11 feet in the harbour from the lake, through the channel and up to the elevators and wharfs.

On July 5 last, authority was given to expend the sum of \$3,000 in effecting repairs to the east pier, and work was commenced early in the same month. The shore end of the pier, for a distance of 500 feet, 18 feet wide, was rebuilt up from the water's edge, and planked, 30 feet wide; also, the outer end, for a distance of 140 feet, 30 feet wide, was replanked, and the outer end of the pier, 75 feet wide, with a return on each side of 30 feet, has been protected with sheet piling.

To perform the above work some 82,415 feet B.M. of pine lumber, 8,995 feet B.M. plank, 44 toise of stone ballast, 1,999 lbs. iron bolts, and 16 kegs of spikes were used.

Expenditure for fiscal year was \$2,991.43.

Total expenditure to June 30, 1901, \$15,256.57, and \$6,731.36 for dredging.

#### BRONTE.

Bronte is situated in the county of Halton, on the north shore of Lake Ontario, 27 miles south-west of Toronto.

The following are the structures in connection with this harbour :—

East pier, 287 feet in length, 24 feet wide, 6 feet above and about 5 feet below low water. Cribs and continuous superstructure.

West pier, 85 feet in length, 18 feet in width, 'L' 6 inches above and 5 feet below low water. Cribs and continuous superstructure.

Breakwater, on west side, 180 feet long, 12 feet wide, 4 feet above, and built on the bottom of the bed of the river, built of brush and stone.



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All the structures are in good repair. Extension of west pier, 150 feet long, is being constructed, to give proper entrance to harbour.

The present depth of water in harbour is only about 6 feet.

Authority was given on August 9 last to expend the sum of \$5,000 in rebuilding the wrecked piers at this place. Work was commenced on August 25, and continued to April, when the appropriation was expended. One hundred and thirty feet of new crib-work and continuous superstructure was built and placed in position on the west side of the harbour, and 100 feet of the old crib-work built up, entirely new, from low water level. Also two cribs each 42 feet in length, 20 feet wide, were placed on the east side with continuous superstructure.

In doing the above work some 82,169 feet B.M. pine, 25,573 feet B.M. hemlock, 1,382 feet B.M. elm, 45 feet oak, 14 loads brush, 139 toise stone, 3,490 lbs. iron bolts, 4 kegs spikes, 161 lbs. nails, and 11 mooring posts were used, costing \$5,000.02.

## BRUCE MINES.

Bruce Mines is situated in the Algoma district, on the north shore of Lake Huron, 45 miles south-east of Sault Ste. Marie. Population, 1,500.

In April, 1900, a contract was let to construct a landing pier, and for dredging. The pier work consisted of a landing block 90 feet square, the outer 20 feet of which is ballasted, close-faced crib-work the full width of 90 feet, and the remaining 70 feet pile work; a trestle work 450 feet in length and 20 feet in width, of pile bents, 12 feet 6 inches apart, and an approach 750 feet long, consisting of stone embankment with gravel roadway. Total structural length, 1,290 feet.

The contract price was \$12,550, and work was commenced in May, 1900, and completed in May last.

Expenditure for fiscal year was \$11,760.62.

Total expenditure to June 30, 1901, is \$19,609.42.

This work was transferred to control of Department of Marine and Fisheries on August 21, 1901.

## BURLINGTON CHANNEL.

Burlington channel, in the county of Wentworth, is simply a cut through a piece of low land which partly separates Lake Ontario from a large sheet of deep water, called Burlington bay, enabling vessels to reach the wharfs at the city of Hamilton. Both sides of the canal are lined with piers.

The following are the several structures connected with this harbour :—

North pier, 2,305 feet in length, consisting of fully ballasted cribs of varied length, of which 2,160 feet is of an average width of 20 feet ; the western outer end, 100 feet in length, is 30 feet, and the eastern outer end, 45 feet, is 30 feet wide. The cribs rest in about 12 feet below, and the superstructure, which is continuous, is 6 feet above low-water level.

South pier, 2,721 feet in length, consists of fully ballasted cribs of varied length, of which 2,094 feet is of an average width of 20 feet ; the western or bay end, 27 feet, is 33 feet wide, and the eastern or lake end, for 600 feet, averages 35 feet wide. The cribs rest in from 12 to 14 feet below, and the superstructure, which is continuous, is from 6 to 8 feet above low-water level.

The whole of the superstructure of these piers is more or less decayed. A contract is being let to reconstruct the superstructure of the western end of the south pier, a length of 991 feet, and to sheet-pile the whole length of the channel side of the piers, in order to allow dredging to a depth of 20 feet, if required.

During the past fiscal year the wages of the working staff of the swing bridge amounted to \$2,050, and the maintenance of same, \$743.31.



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A portion of the east end of the south pier, 150 feet in length, was undermined by the working of the propeller of the barge *Strathcona*, and, settling 4 to 5 feet, fell forward towards the channel. This was repaired, and some 38,176 feet B.M. pine timber and 1,870 pounds of iron spikes and bolts were used.

Expenditure on repairs for fiscal year was \$2,983.58 ; and \$873 for dredging.

Total expenditure to June 30, 1901, \$75,683.37.

## COBOURG.

Cobourg, is an incorporated town of Ontario, in Northumberland county, situated on the north shore of Lake Ontario, on the Grand Trunk Railway, 92 miles west by south of Kingston, 69 miles north-east of Toronto, and is a port of entry. It has several mills, foundries, breweries, and a car factory. Population, 4,239.

The following are the several structures in connection with this harbour:—

*Breakwater, or Langevin pier*, 1,690 feet in length, 30 feet wide, 9 feet above and 13 feet below low water, fully ballasted cribs, and continuous superstructure.

*East, or landing pier*, 1,460 feet in length, of which the government owns the outer end, 460 feet, and the corporation the inner end, 1,000 feet. The outer end is 30 feet wide, and stands 6 feet above and 13 to 15 feet below low water. The structure is constructed of fully ballasted cribs and continuous superstructure.

The municipal corporation also own a 'check pier' 300 feet in length, and a breakwater 1,182 feet in length, 30 feet wide, 6 feet above (depth not known below) low water; also an esplanade on the north side of the harbour, 700 feet long.

The 'Langevin pier' is in good repair, also the landing pier, but the corporation breakwater and 'check pier' are in a state of rottenness above low water.

There is a depth of about 12 feet of water in the harbour. Authority was given on 9th August last to continue the repairs to the piers, and work commenced on 13th September and completed in May. The east pier at the shore end, for a distance of 400 feet, was almost entirely renewed from low water level, and the outer end of same repaired with new stringers and planking where required. The 'Langevin pier' was also repaired at the outer end. In doing the above work some 50,913 feet B.M. pine timber, 11,270 feet B.M. 3-inch pine plank, 100 l. feet hemlock, 23,627 feet B.M. cedar, and 6,518 lbs. iron were used.

Expenditure for fiscal year, \$5,009.04.

Total expenditure to June 30, 1901, \$244,638.13, and \$15,274.18 for dredging.

## COLLINGWOOD.

Collingwood is situated on the south side of the Georgian bay, township of Nottawasaga, county of Simcoe, 94 miles by railway from Toronto. It is the termini of the Northern and Hamilton and North-western railways. There is an extensive trade in ship building, grain and lumber, and it is the starting point of steamers for Owen Sound, Sault Ste. Marie, Parry Sound, &c. Population, 9,000.

As constituted now the harbour is very large and commodious, being protected on the north and east sides by extensive breakwaters. Several small wharfs, belonging to the town or to companies, are built inside the area inclosed by these breakwaters.

The following are the several structures:—

Eastern breakwater, crib and superstructure, 1,786 feet long, 24 feet wide, 18 feet high, good repair.

Outer breakwater, crib and superstructure, 706 feet long, 20 feet wide, 14 feet 9 inches high, good repair.

Stone rip-rap, wood cover, 804 feet long, 30 feet wide, 8 feet 6 inches high, good repair.

Old eastern breakwater, cribs and superstructure, 380 feet long, 15 feet wide, 15 feet high.



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On May 26, 1900, a contract was let to deepen a channel 110 feet wide to 22 feet below zero of gauge, thus giving 20 feet at low water level from the range light inwards. The work was proceeded with at once, and completed in February, 1901, the contractor having removed 47,799 cubic yards of material at a cost of \$107,547.75. The expenditure for superintendence and inspection was \$1,312.84.

On the 28th May last, another contract was let for continuing the deepening and dredging in the outer half of the 110 foot channel, extending from the range light to the bay, to a depth of 22 feet below the zero of the gauge, to give 20 feet at low water from the lake to the elevator and wharfs in the inner harbour. Work was commenced early in May last, and up to June 30, 16,424 cubic yards had been removed at a cost of \$22,993.60.

The government dredge *Challenge* has during the past season dredged a channel from the main channel to the Collingwood Meat Packing Company's wharfs on the west side of the harbour.

Expenditure for fiscal year, \$92,810.98.

Total expenditure to June 30, 1901, is \$280,203.67, and \$138,280.74 for dredging.

## COLPOYS' BAY.

Colpoys village, county of Bruce, is situated on the west side of Colpoys bay, about 3 miles north of Wiarton.

The following is the structure connected with this harbour :—

Landing pier, 300 feet in length. Cribs and spaces, with continuous superstructure, 18 feet wide at shore end ; outer block, 29 feet wide,  $3\frac{1}{2}$  feet high above low water; inner end 2 feet, and outer end  $8\frac{1}{2}$  feet below low-water level ;  $8\frac{1}{2}$  feet of water. Structure is in good repair.

Authority was given on August 3, and confirmed on October 11, 1900, to expend the sum of \$600 in making repairs to the landing pier. Work was commenced on October 21 of same year, and completed on December 4. Nearly the whole of the cribs—seven cribs in the structure—had to be rebuilt above low-water level and replanked, and the approach built up with gravel.

To perform the above work some 8,806 feet B.M. of cedar, 936 feet B.M. of hemlock, 8,640 feet B.M. of cedar and beech plank, 27 logs of maple, 57 cubic yards of gravel, and 719 pounds of iron were used.

Expenditure for fiscal year was \$596.40.

The total expenditure to June 30, 1901, is \$1,196.41.

## DAWSON POINT.

Dawson Point is a landing place where, at low water, freight consigned to Thornloe is unloaded. It is situated on Lake Temiscamingue, opposite Haileybury, in the county of Nipissing, between Wabi bay and the head of the lake.

A wharf was built at this point for landing purposes. It is composed of a crib-work block, 30 x 20 feet, built 145 feet out from shore in 12 feet of water, with an earth and stone approach 15 feet wide on top of roadway. The back of the work is completed, except the top of roadway and the flooring of the block, which are still incomplete.

Total expenditure for fiscal year is \$1,000.

## DESBARATS.

Desbarats is situated in the district of Algoma, and is a station on the Canadian Pacific Railway, 28 miles south-east from Sault Ste. Marie, and on the River Desbarats, about 2 miles from its mouth. The river is too shallow for navigation, and to accommodate the traffic of the place, a wharf was commenced by the township at a



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place called Kensington Point, on St. Joseph's channel, about  $2\frac{1}{2}$  miles to the south-west of the village.

Authority was given on August 9 last to expend the sum of \$1,000 to complete the construction of the wharf. Work was commenced on September 12, and completed on November 14. The work done was the construction of a crib, 40 feet long by 20 feet wide, with a covered space of 20 feet between it and the unfinished wharf, which is 40 feet long, to give a frontage of 100 feet in 20 to 24 feet of water; and the building up of the unfinished or old wharf, from 2 to 5 feet above the water level. In doing the above work, some 7,240 lineal feet of pine, 1,500 feet B.M. pine, 3,000 feet B.M. hemlock, 722 iron spikes and 1,258 pounds iron bolts were used.

Expenditure for fiscal year was \$942.24.

#### GODERICH.

Goderich, in the county of Huron, is situated on the east shore of Lake Huron, at the mouth of the Maitland river, about 68 miles from Sarnia and 60 from London. It is the terminus of the Buffalo branch of the Grand Trunk Railway, and is a place of considerable importance, partly on account of large deposits of salt found in its vicinity. Population, 4,153.

Breakwater.—The breakwater was completed on December 3, 1900. There was a reduction from the original height of structure, as called for in contract, of one foot on front face and two feet on rear or shore face, making the full height as built of 17 and 16 feet respectively, above zero or low water mark.

The work is in good order, presenting a substantial and solid appearance, not having been damaged or displaced by the spring freshets.

Dredging.—During the early part of the season of 1900, there was difficulty in getting the dredge *Arnoldi* to excavate a sufficient amount of rock from inner harbour to compensate for the remuneration per hour she was being paid; and although the rock had been blasted, the dredging company contended that the blasting had been of no effect.

There were also complaints by the captain of the steamer *Rosedale*, that he had struck something in the channel, which had been dredged, leading to the new elevator.

In consequence of these complaints and in order that the responsibility and cause of the complaints might be ascertained, the services of a submarine diver were procured and operations commenced on July 2.

The diver remained in Goderich until August 4, and during his stay was occupied approximately sixteen days in making investigations regarding the rock blasting; removing sunken logs, wreckage, &c.

The substance of the diver's report was that with the exception of two, or three little points requiring from a foot to six inches to be taken off, that the rock was well broken up by blasting.

Blasting.—Very little drilling and blasting was done between July 1 and August 4, 1900, only sufficient to allow the diver to inspect the effect of the shots.

From July 1 to November 15, when the drilling closed down for the season, there was an area of about 12,000 square feet covered; holes being drilled at an average of from 3 to  $3\frac{1}{2}$  feet deep and 5 feet apart, except close up to the town dock, where the rock to be removed was from 5 to 6 feet deep and very hard, and in this place holes were located four feet apart.

In all cases either in shallow or deep rock the holes were drilled to a depth of  $21\frac{1}{2}$  feet below the average low water mark.

The cost of drilling plant.—On April 8, 1901, the crew commenced to overhaul the drilling plant and make ready for active operations again, which commenced on 17th, and continued until June 1, when the plant was made ready to go to Southampton, which it did on the 4th, the weather being favourable.

There were some 7,500 square feet in area of deep, and most of it extremely hard rock, blasted between April 17 and June 1.



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The blasting should be fully completed by the middle of October next, in order to give at least 18½ feet depth at low water mark, in inner harbour, south of a line drawn eastward, from and in prolongation of the south side of north pier, until it meets the Grand Trunk Railway dock at east side of harbour.

During the half year commencing July 1, 1900, the dredge worked either in lake beyond piers, between piers, or in inner harbour at hard pan and sand, sand and gravel, mud, gravel and sand, respectively, as the weather permitted, but always with the object in view of taking advantage of calm weather for out in lake, then between piers, and finally in inner harbour, to equalize the width and depth of the channel gradually, all over, to facilitate navigation for large vessels expected at the new elevator.

There had been much difficulty during the early part of the season, for the dredge to remove the rock that had been blasted, but after the report made by the submarine diver who inspected the blasted rock, it was found that the cranesman of dredge had been allowing dipper to drop to as great a depth as it could until striking solid rock, which sometimes was in deep holes, where large pieces of rock had been taken out, and in many cases, from two to three feet deeper than it was desired to dredge the harbour, in consequence the teeth of dipper would come in contact with solid rock at the sides of the holes, causing the trouble.

The average cost per cubic yard for moving the several classes of material during the half year, commencing July 1, 1900, was as follows :—rock, 85 cents ; sand gravel and mud, 14 cents, and hard-pan, 51 cents.

Several very large vessels entered the harbour during the season, the deepest draft of which was 17 feet 6 inches, and the largest was the *Penobscot*, measuring 376 feet long and 44 feet beam, carrying 138,000 bushels of wheat, her full capacity is 160,000 with which she could have entered the harbour here, but could not leave Chicago carrying more than she did.

The dredge closed down for the season on November 16, and commenced work again on April 22, 1901, working every day that the weather would permit, cleaning out sand which had drifted into the channel near the entrance to piers during fall storms and spring freshets, until the channel was in same condition as it had been left in fall. This drifted sand covered an area of about 490 feet long by 100 feet wide, and from one to four feet deep, amounting to about 11,000 cubic yards of hard-packed sand which it took the dredge 199 hours to remove, at a cost of \$1,592. Therefore as the channel is now 150 feet wide at this point, and should the sand drift to the same extent every year, it will necessitate the expenditure of about \$2,000 each spring to keep the channel clear to its full depth.

The average cost of removing the several materials between April 22 and June 30, 1901, was: for rock, 60 cents; for hardpan, 34 cents, and for sand, gravel and mud, 13½ cents per cubic yard ; making a reduction of 25 cents per yard for rock over the previous fall, 17 cents for hardpan, and ½ cent for sand, &c. Some allowance should be made in considering the cost of dredging sand, mud and gravel, as the dredge used her small dipper most of the time, as she was engaged principally in excavating rock and hardpan, which she could do to better advantage with a small dipper, which it was hardly expedient to change to dredge the softer materials spasmodically.

South pier.—As considerable damage had been done to the decking and part of the waling of the south pier by storms and ice of the winter season of 1901, and by fire caused by combustion of some slack coal piled, presumably, at the direction of the town corporation, close up against the east end of pier, permission was asked and granted to repair the damage, placing two new snubbing posts, &c.

The whole of the work was performed during April, leaving the appearance of pier in a fairly good condition, which should last for some years. There were \$72.06 spent in material, and \$40.75 for labour.

North pier.—The repairs to the north pier, for which \$2,100 was granted, were commenced in November, but work could only be carried on to advantage for a day or two, on account of the weather. The work was resumed on April 25, and was practi-



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cally completed by July 10. Part of the pier, for about 400 feet on south side, was entirely built up new from the water edge, and the alignment was straightened. The south side of the lighthouse block was propped up and sheathed, having caved in during the fall from the effects of decay and the storms.

Several new snubbing posts were placed, new flooring, including sleepers for upwards of 600 feet, was laid, new steps were made, all of which gives the structure a cared-for appearance, and will prolong its life for five or six years longer.

The expenditure for fiscal year amounts to \$53,839.10, including \$12,994.65 for dredging.

Total expenditure to June 30, 1901, \$629,233.06 ; and \$61,153.20 for dredging.

#### HAILEYBURY.

Haileybury, a post village in Nipissing county, is situated on the west shore of Lake Temiscamingue, near the entrance into Wabi bay.

During the fiscal year the building of a wharf was commenced to accommodate the local trade. When completed, this wharf will have a crib-work head, 40 feet face, 20 feet wide, built in 10 feet of water, and connected with the shore by an approach built of stone and earth, 528 feet long, 15 feet wide on top of roadway. The amount granted by parliament being too small to complete this work, about one-half of the approach and a portion of the crib-work to the W.L. were built at a cost of \$2,000.22.

#### HAWKESTONE.

Hawkestone is situated on Lake Simcoe, county of Simcoe, 14 miles east of Barrie, on the northern division of the Grand Trunk Railway.

On April 9, 1900, a contract was let to construct a wharf 300 feet in length, to consist of an approach of stone embankment and gravel, 150 feet long, 16 feet wide on top, and 150 feet of crib-work, superstructure and spaces. The contract price was \$2,475. The work was completed on 16th October last.

Expenditure for fiscal year, \$2,862.95.

Total expenditure to June 30, 1901, is \$3,412.95.

#### HILTON.

Hilton, a small village in the county of Algoma, is situated on the north shore of St. Joseph's island, in the north passage of Lake Huron, 5 miles from Stobie, on the Canadian Pacific Railway. It contains three churches, two stores, one hotel and two saw-mills.

Authority was given on September 27, 1900, to expend the sum of \$500 in effecting repairs to the landing pier by day labour. Work was commenced on 23rd October, and completed in April last. The work consisted in repairing the outer end of the pier and approach with new timbers, stringers and plank, as far as the money authorized would permit.

In doing the above work some 10,100 feet B.M., and 530 feet B.M. hemlock and cedar, 1,619 feet B.M. and 662 l. feet pine, 403 lbs. iron and 144 cubic yards gravel were used.

Expenditure for fiscal year was \$498.37.

Total expenditure to June 30, 1901, is \$16,292.64.

#### KINCARDINE.

Kincardine, in the county of Huron, is situated at the mouth of the Penetangore river, which empties into Lake Huron, 31 miles south of Southampton; it is the termi-



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nus of the Wellington, Grey and Bruce division of the Grand Trunk Railway. Extensive salt deposits are found here.

The following are the several structures connected with this harbour:—

*North pier*, 1,504 feet long, 743 feet from outer end, 30 feet wide, thence 514 feet 14 feet wide, and 247 feet, 12 feet wide, outer end, 9 feet, and inner end  $7\frac{1}{2}$  feet high above, 12 to 14 feet below, and faced on harbour side, below low water, 20 feet at outer end and 16 at inner end with close pile work. Structure of irregular cribs and continuous timber superstructure.

*South pier*, 879 feet in length, 111 feet from outer and 30 feet wide, thence 304 feet, 22 feet wide, and 464 feet, 12 feet wide. Height irregular from 9 to 7 feet above, and from 14 to 10 feet below low water, faced with pile work 16 feet below low water. Structure of irregular cribs and timber superstructure.

The inner harbour or basin is formed by close-pile work, on the east 452 feet, and on the west side 261 feet in length, 7 feet above and 14 to 16 feet below low water, and 12 to 15 feet of deck at back. There is a depth of water of from 12 to 14 feet in the channel and basin. The north pier is in good repair at the outer end for a distance of 372 feet, thence 371 feet is having a new superstructure built from low water up. The shore end is in good repair.

The south pier is in good repair for 111 feet from outer end, thence 304 feet requires new superstructure. The pile work around basin is in a fair state of repair.

At the last session of parliament the sum of \$5,000 was appropriated for improvements to the harbour. Surveys and examinations were made, and plan with report submitted with respect to the proposed improvements.

Authority was given on June 20, 1900, to employ Messrs. Bowman & Porter's plant to dredge the channel and inner basin of the harbour. This work was commenced on July 23, and completed on August 28. The dredge worked 302 hours, and removed 30,654 cubic yards of material, at a cost of about  $11\frac{1}{2}$  cents per cubic yard.

On February 8, authority was given to expend the sum of 1,100 in effecting repairs to the north and south piers, in addition to \$200 authorized in October last for new mooring posts. Fourteen mooring posts were placed in the piers in December. The repairs were commenced in March, and completed in May, and some 396 lineal feet 8-inch x 10-inch oak, 12,200 feet B.M. 3-inch tamarack plank, 17,000 feet B.M. cedar, 20 cords of stone, and 989 pounds of iron were used.

Expenditure for fiscal year, \$3,787.52.

Total expenditure to June 30, 1901, \$151,657.26 ; and \$28,937.21 for dredging.

## KINGSVILLE.

Kingsville, county of Essex South, is on the north shore of Lake Erie, about 25 miles east of the mouth of the Detroit river, is a station on the Detroit, Essex and Lake Erie Railway. Population, 1,537.

The following are the several structures connected with this harbour:—

*Landing pier*, east side of harbour, 825 feet in length, 40 feet at outer end, 50 feet in width; 320 feet, 36 feet in width, and the shore end 24 feet in width, 5 feet 6 inches above low water. Structure of pile bents, caps, stringers, and flooring, filled with stone and brush, close-pile faces below and face timbers above, except outer block, 40 feet x 50 feet, which is of crib-work, and superstructure. The whole of the structure was reconstructed above low water.

*Breakwater*, west side of harbour, 1,100 feet long, 20 feet wide, 8 feet above, and 10 feet below low water.

The breakwater is in a very dilapidated, rotten condition above low water for 625 feet out from the shore, and is now being repaired. The outer end is in fair repair.

There is from 6 to 10 feet in the harbour, but on the bar at entrance only some 6 feet of water.



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Authority was given on August 9 last to expend the sum of \$10,000, and on April 13 a further sum of \$5,000 to repair the landing pier was authorized. The work was commenced on October 8, and completed on June 30.

The repairs consisted in stripping the whole of the old structure down to 1 foot below low water, and rebuilding same with new face timbers, ties, stringers and decking. To do this work, some 330,000 feet B.M. cedar, 72,590 feet B.M. pine, 14,653 feet B.M. black ash, 15,367 feet B.M. fir, 4,728 feet B.M. oak ; 640 feet B.M. maple, and 42,599 pounds iron were used.

Expenditure for fiscal year was \$14,989.45.

Total expenditure to June 30, 1901, is \$79,667.48.

This pier was transferred to control of Department of Marine and Fisheries on February 21, 1885.

#### LANCASTER.

The town of Lancaster, situated in the county of Glengarry, 54 miles west of Montreal, has a population of about 1,000 ; it is a station on the Grand Trunk Railway.

South Lancaster is situated one mile and a half south of Lancaster, on the north shore of Lake St. Francis.

In February, 1901, the construction of a wharf was commenced. It consists of a head block 84 feet in length by a width of 72 feet, on piles, and a solid stone embankment, 356 feet long, from shore to head block, by a width of 20 feet at the top, with slope one in one on both sides ; a store-house and waiting-room was erected thereon.

In May, 1901, the wharf, though not completed, was open to traffic.

At the end of the fiscal year the work, carried out by day labour, was not completed. The amount expended was \$5,013.13.

#### LEAMINGTON.

Leamington is situated in the county of Essex, on the north shore of Lake Erie, 37 miles from Windsor. Population about 2,000.

On February 5 last a contract was let to construct a wharf 1,061 feet in length, the work to consist of pile bents 8 feet 6 inches between centres for a distance of 811 feet, from the shore outwards, then two cribs each 105 feet long, and an 'L' crib, 40 feet by 90 feet long, running south-east.

Active operations were commenced in May, and the whole of the pile work completed, and nearly all the lumber for the rest of the work was on the ground on June 30.

Up to the end of the fiscal year the expenditure on the above contract amounted to \$8,466.11.

#### LION'S HEAD.

Lion's Head is situated in the township of Eastnor, in the northern portion of the county of Bruce, and on the western side of Georgian bay, about 35 miles to the northward of Wiarton. Population about 300.

Exports lumber, ties, square timber, &c.

The following is the structure connected with this harbour:—

*Breakwater*, on west side of entrance to harbour (used as a landing pier) 268 feet in length, and 20 feet in width, built of fully ballasted cribs and continuous superstructure. The outer end is in 14 feet of water, and the structure stands 8 feet above.

There is a depth of 14 feet on the south, or inside the breakwater.

On August 3, 1900, authority was given to expend the sum of \$1,000 by day labour in effecting repairs to the landing pier, and work was commenced on September 20,



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and completed in May last. The work consisted of renewing the superstructure of the pier, a length of 270 feet, and replanking same. The above work required some 18,600 feet B.M. cedar, 40 l. feet maple, and 1,150 lbs. iron.

Orders were issued on November 3 to employ Messrs. Bowman & Porter's plant to do necessary dredging, and the dredge worked 174 hours, and removed 8,062 cubic yards.

Expenditure for fiscal year was \$2,096.93.

The total expenditure to June 30, 1901, is \$10,808.53, and \$2,362.63 for dredging.

## LITTLE CURRENT.

Little Current, Algoma county, is at the passage between Cloche and Great Manitoulin islands, and on the direct route to Lake Superior for vessels taking the north channel of Lake Huron and Georgian bay; it is about 140 miles from Collingwood.

On June 8, 1900, instructions were given to expend the further sum of \$1,000 to continue the operations for the removal of rocks in the bed of the north channel, which were a constant hindrance to the safe towing of rafts of timber. Work was recommenced, and carried on until May, when the work was completed.

The total amount of rock removed from the shoals from March, 1900, to May, 1901, was 3,800 cubic yards, at a cost of \$2,526.27, and a good clear channel has been obtained.

Expenditure for fiscal year was \$398.20.

## MEAFORD.

Meaford is an incorporated town in the county of Grey, and is situated on the west side of the Georgian bay, 18 miles west of Collingwood, and 20 miles to the eastward of Owen Sound. It is the terminus of the Northern division of the Grand Trunk Railway. Population, 2,500.

The following are the several structures connected with this harbour :—

Landing pier, on west side of harbour, cribs and superstructure, 560 feet long, height, 7 feet above low water, 30 to 40 feet wide, portion above low water decaying. One hundred feet of the outer end of this structure is to be removed to widen entrance to harbour.

Breakwater, on east side of harbour, 625 feet long, 20 feet wide, of which 180 feet at the shore end is stone, with rip-rap sides; the rest cribs and continuous superstructure.

*Note.*—An extension of 300 feet is being made to this breakwater of crib-work and continuous superstructure.

Pile revetment work on west side of inner harbour, 1,150 feet in length; of this 290 feet at the north end is a wreck. The rest is in good repair.

Close pile revetment work, on the east side, 930 feet in length, is under contract, and the same contract includes the deepening and enlarging of the harbour, to 20 feet below low water level.

On June 15, 1900, a contract was let to construct 930 feet of close piling on the south-east side of the harbour, extending from the east abutment of the road bridge, in a north-easterly direction, to the east pier; the extension of the east breakwater 300 feet in length, and dredging to 20 feet at low water, an area in the harbour to accommodate large sized vessels, and the removal of 100 feet from the outer end of the western pier, in order to widen the entrance. The amount of tender was \$62,570.

Work was commenced in August, of the same year, but owing to inadequate plant the progress was behind the terms of the contract, and the dredging plant of the Owen Sound Dredge and Construction Company was obtained to assist the contractor on condition that the department guaranteed the payment for work performed. It was also found necessary to construct a concrete wall 150 feet in length in front of the new



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elevator, in lieu of the proposed pile work, in order to prevent delay in the construction of the elevator. Active operations ceased for the season on December 31 last and dredging was resumed on May 14.

At the close of the fiscal year, 90,115 cubic yards of material had been removed, at a cost of \$13,517.25. The 150 feet of concrete wall cost \$5,292.78, and superintendence and inspection, \$2,149.46.

During the past year a large elevator was erected with a capacity of 700,000 bushels, with machinery capable of handling 15,000 bushels per hour, and the Grand Trunk Railway have extended their track to the harbour.

Expenditure for fiscal year was \$22,914.35.

Total expenditure to June 30, 1901, is \$97,499.11, and \$6,602.13 for dredging.

#### MIDLAND.

Midland, Simcoe county, is the terminus of the Midland division of the Grand Trunk Railway, on Georgian bay. Population, about 3,500.

Large quantities of lumber are shipped to and from this harbour, and the railway company has two large grain elevators at this place. During the past two years the Canada Iron and Furnace Company has erected large smelting works.

The following is the structure connected with this harbour :—

Esplanade of close piling, 2,961 feet in length, decked back 16 feet ; height, 8 feet above, and depth 16 feet below low water. The northern end for a distance of 1,000 feet requires replanking, many of the piles above low water are rotten, and fenders fallen off.

Vessels drawing 18 feet of water use this harbour up to the elevators.

Authority was given to send the plant of the Owen Sound Dredge and Construction Company to this place, to perform the necessary dredging required, in front of the Canada Iron and Furnace Company's wharfs and docks. Work was commenced on May 1, 1900, and operations were carried on until August 25. The plant worked 1,039 hours and removed 54,460 cubic yards.

Expenditure for fiscal year amounts to \$6,694.

Total expenditure to June 30, 1901, \$76,435.38, and \$14,856.83 for dredging.

#### NORTH BAY.

North Bay, a town in the county of Nipissing and district of Algoma, is situated at the upper or west end of Lake Nipissing. It is the terminus of the Grand Trunk Railway, at this point connecting with the Canadian Pacific Railway, 227 miles north of Toronto. The town is of considerable importance, and is growing very fast. Population, about 2,000.

The following is the structure connected with this harbour :—

Landing pier, 1,030 feet in length, with an 'L' at outer end 250 feet long ; the structure consists of trestle work from the shore end outwards, 780 feet in length, of pile bents, 7 piles each bent, and 10 feet between centres ; thence fully ballasted crib-work with continuous superstructure. The structure is 25 feet wide, and stands 9 feet above extreme low and 3 feet above extreme high water. There is an average depth at the outer end of 9 feet 6 inches. The structure is new and in perfect repair.

Authority was given on August 9 last to expend the sum of \$2,300 in levelling up the outer end of the pier and in placing pile protection work along the outer front of the structure to prevent further settling of the crib-work.

Work was commenced on November 7, and the pile protection work finished in March last, but owing to the difficulty and cost of obtaining plant, all the levelling up could not be completed with the appropriation.



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To perform the above work, some 14,566 feet B.M. pine, 303 tamarack piles, 35 feet long, and 4,837 pounds iron bolts and spikes were used.

Expenditure for fiscal year was \$3,489.07.

Total expenditure to June 30, 1901, is \$21,430.47.

## OAKVILLE.

Oakville is situated on the north shore of Lake Ontario, in the county of Halton, 22 miles west of Toronto. Population, about 1,700. It contains several mills and factories and a shipyard. The trade of the place is local. It is a station of the Hamilton branch of the Grand Trunk Railway.

The following are the structures connected with this harbour:—

West pier, 588 feet in length, of which 61 feet at outer end is 17 feet wide; 130 feet 12 feet wide; 100 feet 28 feet wide; 297 feet 12 feet wide, and 6 feet high, and depth below low water not known.

East pier, 600 feet in length, of which 468 feet is 20 feet wide, and 132, 15 feet wide. 450 feet at outer end is 7 feet 6 inches, 150 feet 5 feet 6 inches above, and 198 feet 16 feet, and 402 feet 14 feet below low water. The structure is composed of fully ballasted cribs, with continuous timber superstructure.

The depth of water from the lake to the east pier is about 12 feet, and shallows inside piers.

All the structures are being placed in thorough repair.

Authority was given on August 9 last to expend the sum of \$5,000 to complete the repairs to the piers. Work was commenced on August 22, and appropriation expended by May 20.

The whole of the superstructure of the west pier, a length of 500 feet, was rebuilt from low-water level, and the outer end strengthened. The east pier has also been levelled up.

In performing the above work, some 126,579 feet B.M. pine, 8,246 feet B.M. hemlock, 2,175 lineal feet poles, 12 oak mooring posts, 2,030 pounds iron bolts, 257 pounds spike, and 55 toises of stone have been used.

Total expenditure for fiscal year was \$5,019.20.

Total expenditure to June 30, 1901, is \$46,647.46.

## OWEN SOUND.

Owen Sound, in the county of Grey, is situated at the mouth of the Sydenham river, which flows into the head of Owen Sound, an arm of Georgian bay. The town is the centre of an extensive agricultural district, and is the terminus of the Grand Trunk Railway branch of the Georgian Bay and Lake Erie division; also of the Canadian Pacific Railway, Toronto, Grey and Bruce division. There are several lines of steamers running to and from Owen Sound. Population, 9,500.

During the past three seasons the largest vessels sailing the lakes have been able to load and unload in this harbour.

The following are the several structures:—

Close-pile protection work, constructed 1880-1.

West side of entrance to harbour, 1,060 feet, all rotten above water.

East side of entrance to harbour, 550 feet, all rotten above water.

East side in harbour, 700 feet, renewed by Canadian Pacific Railway Company in front.

West side in harbour to form esplanade, 1,500 feet, built in 1895.

Total, 3,810 lineal feet.

When the work under construction is completed, there will then be a total length of pile work of 4,545 lineal feet.



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The height of the pile work is about 6 feet above low-water level, and the new pile work is driven 32 feet below low water.

There is 20 feet of water at the entrance to channel and in the harbour.

On July 31, 1900, a contract was let to the Owen Sound Dredge and Construction Company to construct close-piling on the west side of the entrance to the harbour, a length of 1,895 feet, for the bulk sum of \$28,425. Active operations were commenced on this work in May last, and up to June 30, 480 lineal feet of the pile work at the outer end had been completed.

Expenditure for fiscal year was \$9,727.28.

Total expenditure to June 30, 1901, is \$262,693 ; and \$39,104.35 for dredging.

This harbour was transferred to the control of the Department of Marine and Fisheries November 18, 1882.

#### OXENDEN.

Oxenden is situated on the east side of Colpoy's bay, county of Grey, north riding, about 18 miles north of Owen Sound, and 4 from Wiarton. The village has a population of 100.

Authority was given on August 9, 1900, to expend the sum of \$4,000 in extending the landing pier out into deep water, and on September 20, the foreman of works was appointed and received his instructions, and work was commenced at once, and completed in January last. The work consists in filling the old crib-work with stone rip-rap to form an approach, 100 feet long, then 6 cribs, 20 feet by 20 feet, and spaces 20 feet between the cribs, giving a total length of 460 feet of structure, and a depth of 13 feet at low water at outer end. Some 4,768 lineal feet maple and beach, 1,838 lineal feet hemlock, 577 lineal feet rock elm, 3,074 feet B.M. rock elm, 3,210 feet B.M., cedar, 4,812 feet, B.M., pine plank, 9,222 feet, B.M., cedar plank, 1,162 feet, B.M., hemlock, and 9,018 lbs. iron bolts and spikes, were used in doing the above work.

Expenditure for fiscal year was \$3,709.09.

#### PICKERING.

The harbour of Pickering, formerly known as Frenchman's bay, is situated on Lake Ontario, 21 miles east of Toronto.

The following are the structures in connection with this harbour:—

East pier, 650 feet in length, 12 feet wide for 250 feet from shore end, and 15 feet wide for 400 feet—6 feet above and 7 feet below low water. Structure of cribs and continuous superstructure.

West pier, 650 feet in length, 12 feet wide for 150 feet, and 15 feet wide for 500 feet, 6 feet above and 7 feet below low water. Structure of cribs and continuous superstructure.

The inner end of the piers for a distance of 300 feet each at shore end are in good repair. The outer ends require repairs above low water.

The average depth between the piers is 8 feet, and from piers to inner harbour and private wharf 9 feet.

Authority was given on September 12 to expend the sum of \$2,700 in effecting repairs to the piers by day labour. Work was commenced on October 2 and completed in June.

The work consisted in rebuilding, from low water up, 350 feet in length of the shore end of the east pier, and 250 feet of the west pier. In doing the above work some 66,215 feet, B.M., pine; 16,290 feet, B.M., and 525 lineal feet cedar, 10 mooring posts, and 2,595 lbs. iron were used, at a cost of \$2,700.

Total expenditure to June 30, 1901, is \$7,699.66, and \$5,026.89 for dredging.



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## PORT ALBERT.

Port Albert is situated at the mouth of Nine-Mile creek, on the east shore of Lake Huron, 11 miles north of Goderich, in the county of Huron, township of Ashfield.

The following are the several structures connected with this harbour:—

*North pier*, 420 feet long, 20 feet wide, 7 feet at outer end, and 8 feet at inner end above, and from 12 to 8 feet below low water. Structure of fully ballasted cribs and continuous timber superstructure.

*South pier*, 116 feet in length, 20 feet in width, 8 feet above, and from 5 to 7 feet below low water. Structure of cribs and continuous timber superstructure.

These piers are in good repair.

*Pile-work*, on the north side of harbour, 250 feet in length, 6 feet above, and 8 to 10 feet in depth.

There is a depth of water of 12 feet between the piers, and 10 feet in the harbour.

On December 14 last, authority was given to expend the sum of \$150, which was increased on January 10 to \$450, to make urgent repairs to the embankment behind the pile protection work on the north side of the harbour.

Work was commenced in January, and completed in February. Some 40 cords of stone, 1,530 feet B.M. of hemlock plank, and a large quantity of cedar brush were used.

Expenditure for fiscal year was \$423.84.

Total expenditure to June 30, 1901, is \$27,753.22, and \$2,367.18 for dredging.

## PORT ARTHUR.

Port Arthur, Algoma district, is situated on Thunder bay, at the northern end of Lake Superior. It is an important station on the Canadian Pacific Railway.

The following is the structure connected with this harbour:—

*Breakwater*, 5,161 feet in length, in two sections, the northern end being 3,654 feet long, and the southern end 1,507 feet, 30 feet wide, constructed with fully ballasted cribs and continuous superstructure; height 5 feet 6 inches above, and from 12 to 20 feet below low water. The channel between the two sections is 366 feet wide.

The structure is in good repair, except a portion of the deck planking and some of the mooring posts.

Authority was given on October 11 last, to expend the sum of \$450 to replace planking, iron boiler plates, &c.

The season being so far advanced nothing could be done until the ice formed. Repairs were commenced in April last, and many of the iron boiler plates were replaced, and some 2,000 lbs. of new plates, and 672 l. feet of timber were used.

Expenditure for fiscal year, on repairs, was \$271.96, and \$3,407 for dredging.

## PORT ELGIN.

Port Elgin is in the electoral division of the southern portion of the county of Bruce, on the eastern shore of Lake Huron, about 24 miles north of Kincardine, and four miles south of Southampton. It is a station of the Wellington, Grey and Bruce division of the Grand Trunk Railway. There is no track from the railway to the harbour. Population, 2,000.

The following are the structures connected with this harbour:—

*Breakwater*, central portion is 600 feet long, 8 feet above, and about 8 feet below low water, 20 feet wide; shore or northern extension 900 feet long, 20, 15 and 10 feet wide, 8 feet above, and from 8 feet at outer end to 2 feet at shore end below low water; southern extension 540 feet long, 4 feet above, and 6 feet below low water. The whole of this structure is constructed with fully ballasted cribs and continuous timber superstructure.



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*Landing pier*, composed of a 'T' and an 'L,' the former 440 feet long, and the latter 200 feet long, is in different widths of from 18 to 25 feet, 6 feet above, and from 10 to 12 feet below low water, built of cribs and timber superstructure. Vessels drawing 12 feet of water can use this harbour.

The breakwater is in good repair; the plank covering of the landing pier, for 260 feet in length at south end, is much decayed and the face timbers are in the same condition.

On January 17, 1900, a contract was let to construct an extension to the breakwater, consisting of crib-work substructure, and continuous superstructure, 540 feet in length, and 15 feet in width, for the sum of \$5,240. Work was commenced in May last, and completed on December 15.

Dredging was done in the harbour from June 21 to July 21, by Bowman & Company. The plant worked 187½ hours, and removed 10,885 cubic yards of material, at a cost of 13½ cents per cubic yard.

Expenditure for fiscal year was \$7,275.95.

Total expenditure to June 30, 1901 \$68,227.39, and \$13,122.48 for dredging.

#### PORT FINDLAY.

Port Findlay is in the Algoma district, on the north shore of Lake Huron, about 5 miles below the entrance to Ste. Marie river, and 30 miles south-east of Sault Ste. Marie.

Up to the present time this place has had only a private landing, which was quite inadequate for the traffic. An appropriation was made by parliament for the construction of a wharf, and a contract was let to construct a wharf of the following dimensions: stone and earth approach embankment 170 feet long, 20 feet wide on top, and close faced fully ballasted crib-work substructure, 135 feet long, 30 feet wide with superstructure on top.

The contract price was \$5,730.

Work was commenced on May 25, 1900, but owing to the difficulty of obtaining timber, the time for completion has been extended. The returns show that 2,000 cubic yards of the embankment approach, and 2,500 cubic yards of crib-work has been completed. The balance of the crib-work is all framed and ready to go into place.

Expenditure for fiscal year was \$3,885.

Total expenditure to June 30, 1901, is \$4,639.

#### PORT HOPE.

Port Hope is situated in the county of Durham, on the north shore of Lake Ontario, 63 miles east of Toronto, on the Grand Trunk Railway, and has a population of 4,188. Chief trade is in lumber and grain.

The following are the several structures in connection with the harbour :—

East pier, 1,471 feet in length, of fully ballasted cribs, with continuous superstructure, in various widths of 16, 21, 30, 39 and 64 feet, resting in from 10 to 15 feet below, and superstructure from 6 feet at shore end, and at outer end, for a distance of 777 feet, 9 feet above low water.

West pier, 1,641 feet in length, of fully ballasted cribs, with continuous superstructure, 22 feet wide, and resting in from 10 to 15 feet below, and superstructure 6 feet above low water.

Breakwater, 500 feet in length, of fully ballasted cribs, and continuous superstructure, 20 feet wide, resting in 14 feet below and superstructure 6 feet above low water level.

Vessels drawing 14 feet of water can use this harbour. The piers and breakwater are being put in good repair.



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On July 31 last, authority was given to expend the sum of \$2,000 in effecting certain repairs to the piers. Work was commenced on August 11, and completed October 31. Five hundred feet of the shore end of the east pier was rebuilt, up from low water, and new decking placed on same ; 135 feet of the west pier received considerable repair. That portion of the sand fence which was blown down was re-erected and strengthened ; 4,000 feet, B.M., of new 3-inch plank was placed upon the deck of the east pier.

The following materials were used in doing the above work, viz. : 12,000 feet, B.M., 3-inch plank ; 45,400 feet, B.M., pine timber, and 25 lbs. iron. The old iron bolts and spikes were straightened and used again.

Expenditure for fiscal year was \$4,938.10, including \$2,923.30 for dredging.

Total expenditure to June 30, 1901, \$163,017.64, and \$18,333.22 for dredging.

## PORT STANLEY.

Port Stanley is on the north shore of Lake Erie, at the mouth of Kettle creek, in the county of Elgin, about 85 miles west from the entrance of the Welland canal, and 8 miles south from the city of St. Thomas, and is the terminus of the Lake Erie and Detroit River Railway. Population, about 1,000.

The following are the structures in connection with this harbour :—

West pier, 1,916 feet in length, of which from shore end 584 feet is 12 feet wide, 766 feet 16 feet wide, and 566 feet 30 feet wide. The shore end, a distance of 1,650 feet, is 6 feet above, and the outer end, 266 feet, 8 feet above, and, as far as can be ascertained, from 10 feet at shore end to 15 feet at outer end, below low water.

East pier 1,127 feet in length, of which from shore end 92 feet is 12 feet wide, and 1,035 feet 30 feet wide ; the shore end is 6 feet 6 inches above, and the outer end 7 feet 6 inches above, and the depth below, same as west pier, described above.

Pile protection work, 1,000 feet long, at north end of west pier, 6 feet above, and 25 feet below low water, decked back 12 feet.

The whole of the structures are in good repair.

There is a depth of from 12 to 14 feet through the channel and into the harbour.

Authority was given on August 9 last to expend the sum of \$15,000 in making repairs to the east pier, and dredging. Repairs were commenced on August 29, and completed in May. The east pier was entirely rebuilt from low-water level up, for a length of 380 feet at the south end. The west pier was also rebuilt from low water up at the north end for a length of 300 feet.

In doing the above work, some 8,878 feet B.M. oak, 74,864 feet B.M. pine, 19,475 feet B.M. pine plank, 13,720 feet B.M. cedar, 106 white oak piles, 20 feet long, 16,614 pounds iron bolts, and 1,300 pounds spikes were used, at a cost of \$7,625.85, including dredging.

Dredging was done by one of the government dredges in the harbour and on the bar at the entrance.

The total expenditure to June 30, 1901, \$316,606.92 ; and \$7,550.09 for dredging.

## PORT ROWAN.

Port Rowan, Norfolk county, is on the north shore of Lake Erie, in the inner bay of Long Point, and is 21 miles from the town of Simcoe.

The following is the structure in connection with this harbour :—

Landing pier, 1,080 feet in length, 550 feet of which is an approach of stone rip-rap, filled with stone and gravel, 23 feet wide. The outer portion, 530 feet, is built of ballasted cribs and spaces, decked over, 20 feet wide, with an outer block 40 feet by 30



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feet. The structure stands 5 feet above, and, at outer end, 6 feet below low water.

This pier is in a good state of repair.

Authority was given on August 9 last to repair the landing pier, and work was commenced on August 22, and completed on October 10. The work consisted of renewing 41,565 feet B.M. of deck plank, 1,542 feet B.M. of stringers, 1,000 pounds spikes, 177 pounds iron bolts, 2 loads brush, and 50 cubic yards gravel.

Expenditure for fiscal year was \$1,188.67.

Total expenditure to June 30, 1901, \$13,248.53.

#### PROVIDENCE BAY.

Providence bay, Algoma district, is situated on the south shore of the Manitoulin island, Lake Huron, about 12 miles north-west of Michael's bay, and 30 miles by road from Manitowaning, and 25 miles from Gore bay.

On August 27 last, a contract was let to construct a wharf, 316 feet in length, of which, at the shore end, is an approach 20 feet wide of stone rip-rap. The outer end is crib-work, 20 feet wide, fully ballasted and continuous superstructure, composed of an outer block 100 feet long, and two inner blocks of 50 feet each, the contract price being \$7,500.

Work on the wharf was commenced in September last, and completed at the end of the fiscal year.

Expenditure for fiscal year, \$6,144.

Total expenditure to June 30, 1901, \$6,398.66.

#### RONDEAU.

Rondeau is situated in the county of Kent, at Point au Pins on the north shore of Lake Erie, about 140 miles west of Port Colborne, the Lake Erie entrance to the Welland canal. It is a harbour of refuge and a very important one on this side of the lake. Of late years the beach at Rondeau has become a much frequented summer resort and many cottages have been erected. The Erie and Huron Railway have constructed their line this far, and have established a dock for lake ferry to deliver coal in cars from the other side.

The following are the several structures connected with this harbour :—

West pier, 1,097 feet in length, of which from shore end 307 feet is 21 feet wide, 450 feet 25 feet wide, 285 feet 30 feet wide, and 55 feet 51 feet wide ; shore end is 5 feet 6 inches and outer end 7 feet 1 inch above low and 22 feet below low water. Structure of fully ballasted cribs and continuous timber superstructure. The whole of this pier is in thorough repair.

East pier, 786 feet in length, of which from shore end 445 feet is 24 feet wide, 290 feet 29 feet wide, and 51 feet 52 feet wide. The whole of this structure stands 7 feet 3 inches above and 22 feet below low water. Structure of fully ballasted cribs and continuous timber superstructure. The superstructure is all decayed, and an appropriation has been made to renew same.

Breakwater, on east side of harbour, 338 feet in length, 12 feet wide, 6 feet above and 7 feet below low water, built of cribs, and filled with stone. Deck timbers and stringers badly decayed.

Approach to east pier, 40 feet long, 6 feet 6 inches wide, 7 feet high, resting on ground, faces of timber tied and filled with stone and gravel and decked over. In good repair.

There is a depth of water from 14 to 18 feet through the channel, and into the harbour, but a bar at the mouth, extending eastward in the channel approach, has only some 12 feet of water over it, and requires to be removed.

Authority was given on August 9 last, to expend the sum of \$9,500 in continuing



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the repairs to the piers. Work was commenced on August 22, and completed in May. The whole of the superstructure of the west pier, at the outer end, a distance of 350 feet, has been renewed from low water up, and the northern end of the same pier, for a distance of 300 feet, has also been renewed.

In doing the above work some 99,100 feet, B.M., pine ; 87,496 feet, B.M., cedar ; 4,930 feet, B.M., oak ; and 20,351 lbs. iron bolts and spikes were used, at a cost of \$9,537.95.

Total expenditure to June 30, 1901, is \$316,014.32, and \$6,030.53 for dredging.

This harbour was transferred to control of Department of Marine and Fisheries, December 17, 1888.

## SARNIA.

Sarnia is situated in the county of Lambton, near the head of the St. Clair river, 61 miles west of London. Population, 8,000.

At the last session of parliament the sum of \$11,250 was voted for dredging, and a bulk sum contract was let on September 15 to do the work for \$9,500. It is estimated that some 100,000 cubic yards will have to be removed. Work was commenced on October 1, and continued until December 12, when some 38,000 cubic yards of material had been removed. Work was again resumed on May 28.

Expenditure for fiscal year, \$3,568.27.

## SAUGEEN RIVER.

Saugeen river, empties into Lake Huron, 143 miles above Sarnia, it passes through the village of Southampton, situated on the shore of this lake, in the north riding of Bruce.

The following are the structures connected with this harbour:—

*Breakwater*, or north pier, 700 feet in length, of which 393 feet is 24 feet wide, 190 feet, 20 feet wide, and 117 feet, 16 feet wide. The structure consists of fully ballasted crib-work, and continuous superstructure, which stands 6 feet above low water, and the depth goes out from the shore end to 12 feet at the outer end. All in good repair.

*South pier*, or landing pier, 350 feet long, of which 75 feet at the outer end is 30 feet wide, and 275 feet, 25 feet wide. It consists of fully ballasted cribs and continuous superstructure. The crib-work stands in from 8 to 12 feet of water, and the superstructure is 6 feet above low water level. There is a depth along the channel side of from 5 to 9 feet.

This structure is more or less decayed above low water.

Authority was given on August, 7, 1900, to expend the sum of \$3,400 to repair the breakwater on the north side of the entrance to the Sauble river and the harbour. Work was commenced on September 3, and completed in January last. The work consists in rebuilding the superstructure of the shore end of the breakwater, a distance of 462 feet, from low water up. 150 feet is 16 feet wide, 157 feet, 22 feet wide, and 155 feet, 25 feet wide. In doing the above work some 70,984 feet B.M. pine, 529 l. feet pine, 8,196 feet B.M. pine plank, 26,789 feet B.M. cedar, 463 l. feet cedar, and 1,103 lbs. iron bolts were used.

Expenditure for fiscal year, \$4,282.54.

Total expenditure to June 30, 1901, \$37,534.32.

## SHEGUINDAH.

Sheguindah, Algoma district, is situated on the east end of Manitoulin island, at the entrance to Heywood sound, and at the western end of Sheguiandah bay. The vil-



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lage is 6 miles south of Little Current, and 16 miles north of the village of Manitowaning.

On August 27 last, a contract was let to construct a wharf at this place, a total length of 445 feet, composed of a shore approach of stone rip-rap, filled with stone, finished with a gravel road-bed, 220 feet in length, and 20 feet wide on top; pile trestle work, consisting of bents of five piles each, placed  $12\frac{1}{2}$  feet apart, 125 feet in length, and 20 feet wide, with a head block composed of bents of 9 piles each,  $12\frac{1}{2}$  feet apart, 100 feet in length, height of flooring being 5 feet above low water level, giving a depth of water at the outer end of 10 feet. The contract price being \$5,900.

Work on the wharf was commenced in September last, and completed at the end of the fiscal year.

Expenditure for fiscal year was \$2,964.

Total expenditure to June 30, 1901, is \$3,096.80.

#### SOUTH NATION RIVER.

South Nation river takes its rise in the township of Matilda, in the county of Dundas, and after a very irregular course of 100 miles, enters the Ottawa river 5 miles below Plantagenet. There are several large tributaries, which render it almost insufficient, especially during freshets on account of its small flowing capacity, to carry all these waters without overflowing the banks and flooding large areas of land. Apart from this there exist obstructions in the bed of the river, which impede the flow of the stream, and their removal would give a freer course to the discharge, and the flooding of lands would be averted to a certain extent.

The most serious of these obstructions is called the 'Pitch-off,' situated about  $1\frac{1}{2}$  miles above Plantagenet, and  $6\frac{1}{2}$  miles above the outlet of the river. It consists of a ridge of solid rock which crosses the river, almost from bank to bank, with an average width of 300 feet, and an elevation of about 4 feet above low water level. The river at this point is 400 feet wide.

Some years ago on the east side of the river a cut, 100 feet wide and 1 foot deep below L.W., was made through this obstruction by the local government to drain the river above and to stop the summer floods which caused considerable damage to crops over an area of about 10,000 acres.

During the fiscal year this cut was widened to 225 feet, and excavated to a depth of  $1\frac{1}{2}$  feet below low water, by removing 6,500 cubic yards of solid rock at a cost of \$5,017.16.

#### SUMMERSTOWN.

Summerstown, in the county of Glengarry, is situated on the north shore of Lake St. Francis, 8 miles east of Cornwall.

During the month of November, 1900, some temporary repairs were done, especially to the flooring of the wharf.

The work was carried out by day labour, at a cost of \$554.61.

#### THORNBURY.

Thornbury, an incorporated village in Grey county, is situated at the mouth of the Beaver river, which empties into Georgian bay; on the Meaford branch of the Grand Trunk Railway, 8 miles from Meaford, and 19 miles from Collingwood. It contains four churches, twenty stores, two hotels, two grist, one saw, one woollen and one planing mill, two printing offices, issuing weekly newspapers, and telegraph and express offices. Population 900.



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The following are the several structures connected with this harbour :—

Landing pier, on the west side of harbour, cribs, spaces and superstructure, with pile sheeting at sides and outer end, 500 feet long (200 feet, 24 feet wide, 300 feet 40 feet wide), 10 feet above, and from 7 to 12 feet below low water. Cribs very much decayed, superstructure in fair repair.

Breakwater on east side of harbour, close piles and stone talus 400 feet long, 8 feet above low water. Piles above water decaying.

Cross breakwater of cribs and superstructure, 285 feet long, 12 feet wide, 14 feet high, in good repair.

Pile revetment work, south side of harbour, 400 feet long, with plank wharfage, 12 feet wide. In good repair.

There is a depth of 13 feet below low water in the harbour.

Authority was given on August 9 to expend the sum of \$1,000, in effecting repairs to the harbour works, and work was commenced on September 4, and completed in May last. The work consisted in general repairs to the landing pier, planking, stringers, &c., where required, and sheathing behind the pile work on the south side of the harbour, 400 feet in length. In doing the above work some 17,350 feet, B.M., cedar plank ; 1,500 lineal feet cedar logs ; 2,850 feet, B.M., cedar ; 100 lineal feet cedar ; 1,400 feet, B.M., hemlock plank 620 lbs. nails ; 225 lbs. spikes ; and 105 lbs. iron bolts were used. Expenditure for fiscal year, \$999.92.

Total expenditure to June 30, 1901, is \$40,714.13, and \$14,622.21 for dredging.

## TORONTO HARBOUR.

The harbour of Toronto is situated on the north shore of Lake Ontario, and is formed by a large circular bay  $1\frac{1}{2}$  miles in diameter, separated from the lake by a low island (formerly a peninsula) about 6 miles long, making a safe and well-sheltered harbour capable of containing a large number of vessels.

During the past fiscal year 5 cribs were constructed and sunk in position in the west pier extension, and filled with stone.

1 crib, 21 courses completed.

1 " 18 " "

1 " 9 " "

The superstructure has been completed on 4 cribs up to flooring cross-ties, and filled with stone.

The south end of west pier, that had settled, has been brought up to proper level, and two-thirds of the planking laid ; 76,878 cubic yards of sand, scow measurement, have been dredged from the channel, approaches, and bar south of east pier.

Expenditure for fiscal year is \$40,836.60 ; and \$368.77 on diversion of Don river.

Total expenditure to June 30, 1901, is \$1,194,891.44, including dredging.

## VICTORIA HARBOUR.

Victoria harbour is situated in the county of Simcoe, on Matchedash bay, 10 miles west of Midland.

Authority was given on August 16 last to employ the plant of the Owen Sound Dredge and Construction Company to do some necessary dredging, and work was commenced on August 27 and continued until September 21, during which time the plant worked  $207\frac{1}{2}$  hours, and removed 13,416 cubic yards, at a little over the cost of 8 cents per cubic yard.

Expenditure for fiscal year was \$1,700.



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## WIARTON.

Wiar-ton is situated in the North Riding of the county of Bruce, at the head of Colpey's bay, about 32 miles north of Owen Sound. It is the terminus of the Georgian Bay and Lake Erie Branch of the Grand Trunk Railway.

Vessels drawing 16 feet of water can use this harbour.

The following are the structures built by the department at this place :—

Wharf, parallel with the shore at north end of harbour, 1,040 feet long ; 6 feet above low water, constructed of crib-work, with stone filling and continuous superstructure, forming a wharf and esplanade. There is 14 feet of water along the face of this structure. This wharf was built in 1883-4, and the timbers above low water are more or less rotten.

Breakwater, 600 feet long, 25 feet wide, constructed of crib-work with continuous superstructure ;  $5\frac{1}{2}$  feet above low water, 10 feet deep at the shore end, and 16 feet at the outer end. This structure is in a very fair state of repair.

On March 7 last, a contract was let to construct a landing pier 350 feet in length inside the breakwater, the amount of the contract being \$13,320. Work was commenced in May, and good progress has been made with the construction.

On May 7, authority was given to expend the sum of \$400 in making certain repairs to the breakwater, and work was commenced at once, and completed in June. In making the repairs, about 14,000 feet B.M. plank, 3,400 feet B.M. timber for stringers, and 510 pounds of iron were used.

Expenditure for fiscal year, \$930.65.

Total expenditure to June 30, 1901, is \$71,578.91.

## PROVINCE OF MANITOBA.

## FAIRFORD RIVER CANAL.

The work of excavating Fairford river canal was carried on during the fiscal year ending June 30 last. The work is composed of a through cut or canal through mostly hard, stiff clay, and intermixed with some gravel and boulders towards the bottom of the excavation, with a ridge of limestone rock at the lower end.

## GIMLI.

Gimli is the most important Icelandic settlement on the west shore of Lake Winnipeg and is 62 miles north of the city of Winnipeg.

The object of building this wharf would be chiefly to afford to the inhabitants of the municipalities of Gimli, Woodlands and Rockwood, proper facilities for carrying on the lumber trade and the fishing industry. In summer, communication can only be had by water with these localities from Winnipeg, as the colonization road is still almost impassable on account of its unfinished state and the swampy nature of the country traversed.

During the past fiscal year very little work was done on this wharf.

Total expenditure to June 30, 1901, is \$9,000.55.

## GULL HARBOUR WHARF.

One hundred and nine lineal feet of this wharf was constructed during the fiscal year ending June 30. The total expenditure incurred to June 30 last was \$2,895.88. The work, so far as undertaken, is completed. It is, so to speak, the only highway or channel leading to the Lake Winnipeg extremities, and it is very much used.



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## HNAUSA WHARF—LAKE WINNIPEG.

Hnausa is an Icelandic settlement situated on the west shore of Lake Winnipeg, Manitoba, about 52 miles north of West Selkirk, and 70 miles north of Winnipeg.

In view of the increasing settlement and trade along the west shore of Lake Winnipeg, a wharf was constructed.

The work of repairs and extension to Hnausa wharf has progressed during the winter. The expenditure incurred to June 30 last was \$5,312.68. This wharf is quite exposed to the furious lake storms during the summer, and tremendous ice shoves during the winter and spring seasons. The ice has somewhat damaged the front of the new work at water level, so that that part of the work shall have to be pulled down and rebuilt to ensure its permanency.

Total expenditure to June 30, 1901, is \$11,041.61.

## SELKIRK WHARF.

The Selkirk wharf is composed of crib and pile work at the upper end, and pile and sheet pile at the lower end, covering a total length of 300 lineal feet. A little dredging was done in front to remove snags, &c., that were thereabout to be found. This work was very much appreciated by the public last season, and they manifest a great deal of gratitude, in fact a strong desire for an extension. It has been in constant use, and evidently a long-felt want. The total expenditure incurred on this wharf was up to June 30 last, \$5,986.18.

## ST. ANDREW'S RAPIDS LOCK AND DAM.

St. Andrew's rapids lock and dam work, started last fall, and was proceeded with until the cold weather set in. The contractors have been somewhat hindered by the frosts this spring, also by the high water, and some wet weather during the early part of the season. The work of excavation of both the upper and lower entrances as well as lock pit was carried on until June 30. The total quantity of excavation done to that date was 20,470 cubic yards, composed of stiff white and blue clay, overlaid with a layer of loam, and some sand at the lower entrance, at 35 cents per cubic yard, equivalent to \$7,165.20. The method used in doing this work was by steam shovel, cars and tracks.

The expenditure for the fiscal year was \$15,412.41.

## BRITISH COLUMBIA.

## ANDERSON AND KENNEDY LAKES.

The work of improvement to the outlets of both the above lakes, is in the interests of prospective mining development in that section, to facilitate the passage of boats, and transportation of supplies to the different claims.

The claims on both lakes are about equal in number and importance, and the work involved in improving the channels about identical. There is not much that can be done in either case further than removing, by blasting, the large boulders and other obstructions so as to make a channel by which boats can be warped up without breaking cargo.

A fairly good amount of work was done with the limited amount at our disposal, a large portion of which was consumed in the necessary outfit of camp equipage, tools,



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&c., required for the operations. These will be available for a continuation of the work should a further appropriation be forthcoming.

## COLUMBIA RIVER BETWEEN ARROW LAKES.

The only expenditure in connection with this service was the payment of the wages of the caretaker of the government property at Cariboo city.

A large amount of the appropriation for this service was intended to cover the construction of a dredge, without which not much further improvement can be made, and if such dredge is to be built it is not advisable to expend much on wing dams, &c., which, in some cases, the work of the dredge would render unnecessary. Pending the construction of the dredge, therefore, there is no further work necessary except keeping the existing dams, &c., in effective repair.

## COLUMBIA RIVER ABOVE GOLDEN.

On July 2 moved dredger *Muskrat* down to Peterboro' landing, with intention of cutting a channel from main river into main bank to make it possible for steamers to reach latter during high water. After four days, during which every possible means was tried to make headway, the work was abandoned, as it was costing about four times as much to move the dirt as it would with horse and scraper. From 7th to 12th of month the dredge was employed finishing the channel through Salmon Beds. There is now a fairly deep and straight channel from Lake Windermere to deep water below Salmon Beds, and as the gravel throughout the whole distance is fairly heavy, and there not being much current, the chances are this portion of the river will not require any work for some years to come.

From May 13 to 21 rock was gathered along the shores of Windermere lake and taken to a dam at the foot of the lake and loaded upon it where broken.

On July 23 started for Red Rock with dredger and two scows, and on the way down cut out sweepers and brush at one or two points, missed by party sent down during May. Also put in several posts at the 'Ess' to snub to when making these very sharp bends. Arrived at Red Rock on 26th, but found water too high to attempt putting in wing-dams.

Having been particularly pressed to open up a channel formerly used by Columbia River Navigation Company, about 10 miles above Golden, known as the 'low-water channel,' the work was done, which occupied dredger up to August 4.

On August 6 started up stream, and arrived at Red Rock on 9th. On the way up cut out brush and sweepers in all the bad places where stage of water would permit.

After taking soundings and making rough survey of bars at head of Red Rock, two wing-dams were constructed to narrow up the channel and to cut the bar. This bar has always been considered the worst of a series along what is known as Red Rock that crossed the river immediately above Red Rock.

From August 10 to 18 was employed cutting and hauling out piles, a particularly difficult task, as the banks of the river have been about completely stripped of any timber fit for the purpose.

On August 21 began clearing away brush on bank from point at which upper dam was started. This dam was constructed as follows:—An ordinary brush and rock mattress was laid on bank, after it had been properly sloped and levelled. From about centre of mattress two rows of piles, the rows 6 feet apart and the piles ditto, were driven for a distance of 90 feet obliquely across and down stream. Heavy brush was then laid across the rows and loaded with rock. Finer brush being afterwards filled in between the piles and well weighted. The end was made secure by tying the four end piles together with wire cable and by rip-rapping.



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The second dam was put in about 1,200 feet farther down stream, and, like the first, ran from east bank of river across stream obliquely. This dam is constructed similarly to one above described, and is 150 feet in length.

The dams answered the purpose for which they were put in, and on October 11 there was a channel not less than  $2\frac{1}{2}$  feet in depth across the bar, and for a distance of several hundred feet above upper dam.

The construction of these dams occupied the dredge until October 11. As the water had by this time got too low to do anything to advantage with dredge, it was taken out of the water.

The banks of the Columbia river, as far as navigation is concerned, are now clean from Windermere lake to Golden, and the steamer *Hyak* ran until she was frozen in at the 'Little Saw-mill,' during first week in November.

Upon examination the hull of the dredge was found to be in bad condition, the old kelsons at bow had to be removed and new ones substituted and generally recaulked, pitched and tarred. The two scows had also to be repaired, and the machinery in dredge thoroughly overhauled. As our appropriation was expended, and these repairs to be of value, had to be done at once to have the plant available so soon as the subsidence of the annual high water would admit of the work being resumed, permission was obtained from Ottawa for an expenditure of \$750. Repairs were completed before the expiration of the fiscal year.

## DUNCAN RIVER.

An examination was made of the upper and lower Duncan rivers, between the head of Kootenay lake and Healy's landing, some 36 miles. The upper and lower rivers are divided by Howser lake, as follows.

	Miles.
Head of Kootenay lake to Howser lake, lower Duncan . . . . .	13 $\frac{1}{2}$
Howser lake. . . . .	8 $\frac{1}{2}$
Head of Howser lake to Healy's landing. . . . .	14
Total . . . . .	36

There was not much to be done on either river further than clearing it of snags, as far as possible, and cutting the projecting trees and sweepers on banks. This work has been fairly well done, and the boats can now run through from Kootenay lake to Healy's without any difficulty other than rapid or low water. The work was started on May 1, and completed on 27th of same month. The expenditure was \$2,692.17.

## FRASER RIVER.

The principal work done was in the construction of a dam, 3,160 feet in length, required to close the opening developed in the past two years by the annual freshets to the northward through the sand heads, about one mile below Garry point at the mouth of the Fraser.

Through an apparent oversight, or lack of funds, this opening has been allowed to enlarge until reaching its present formidable dimensions, it has heavily taxed our appropriation and required all the available time to secure against further development. To have allowed, unchecked, the action of high water of the present year would have resulted in an entire change of channel to the northward, or that with this additional opening, both channels would eventually shoal to an extent to seriously interfere with navigation. It is only by confining the large volume of water during freshet to one outlet and obtaining the full benefit of the scour at that period that a proper depth can







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From a careful examination of the river by canoe from Port Essington to Kitsilas Canyon in October last, it would be better to confine operations to the Kitsilas Canyon for this year, with a view to completion of all work at that point, than attempt to cover too many points, which could only be partially done and with unsatisfactory results. At the Kitsilas Canyon on October 15, 1900, work was commenced and continued until February 25, 1901, when the work was practically completed on the lines contemplated.

There are now three steamers plying on the Skeena, a new one, the *Hazleton*, being added this year by Cunningham & Son. They now consist of the *Caledonia* (H.B.Co.), the *Monte Christo*, and *Hazleton* above mentioned (Cunningham & Son). The *Caledonia* draws too much water to be available at a low water stage. During the construction of the telegraph line from Quesnelle to Hazleton northward, a large amount of supplies was shipped in by this route. A branch of the main line from Hazleton to Port Simpson and Essington has this year been completed, and will prove a great boon to the canneries and shipping interests as the only points on the coast at which such communication can be obtained between Victoria and Alaska.

The snag scow began work on March 25, and was laid up on May 11, having removed the worst of the snags from the mouth of the river to the head of tide water, some 25 miles.

Our appliances for this work, as referred to in my previous reports, are entirely inadequate—a simple hand-winch, such as we have on the scow, with a frame and purchase blocks, has not nearly sufficient power to move the larger snags partially embedded in the sand. A powerful steam winch, combining propelling power by means of a sprocket attachment and stern wheel, would overcome the difficulty and eliminate the heavy charge for tug hire that represents the greater part of the expenditure.

## VANCOUVER HARBOUR.

In compliance with a request of the Canadian Pacific Railway Company in deepening in front of their wharfs in Vancouver harbour by dredging to a uniform depth of 27 feet at extreme low tide; the dredge was moved from Victoria to Vancouver on November 23, 1900, and the work commenced on December 1, 1900, and completed on February 5, 1901. Under a further application of the Hastings Mill Company for similar work, the dredge was moved there, commencing work on February 8, and completing it on March 14, when she was moved by request to Evans, Coleman & Evans' wharf. She began work on March 16, and completed it on April 17. Some work was also done in front of the city wharf, so that a uniform depth of 27 to 30 feet at low tide is now continuous in front of the principal wharfs in Vancouver harbour from the eastern end of the Canadian Pacific Railway wharfs to the Hastings Mill. The material met with was extremely hard, consisting of hard blue clay; boulders, and hardpan, culminating in sandstone rock near the western limit of the Canadian Pacific Railway wharfs, which the company blasted to remove. The work done was satisfactory to all parties, and all the work applied for, and for which instructions had been received, was completed. The dredge returned to Victoria harbour on May 12, and resumed her work at that point.

## VICTORIA HARBOUR.

Before continuing the work of dredging in Victoria harbour it was found absolutely necessary to overhaul and repair the plant and machinery of the dredge, tug *Princess*, and the two hopper scows engaged in the work. These repairs were commenced on July 2, 1900, by hauling out the two scows on Bullen's Ways, and completed by September 19, when dredging was resumed. The *Quadra's* berth was dredged out and the work of clearing up Dredger Rock completed.

On October 9, the hours constituting a day's work on all government work in British Columbia were reduced from 10 to 9.



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On November 10, orders were received to move the dredge to Vancouver, which was accordingly done. Upon her return to Victoria on May 12, 1901, the change in the dipper arms was made and some light repairs, required after the heavy work at Vancouver, and work was begun on Tuzo shoal on June 12, which was completed on the 30th of that month, ending her operations for the fiscal year 1900-1.

The dredging of Dredger rock and Tuzo shoal in Victoria harbour was done in connection with the work of the removal of these rocks by blasting, for which purpose, as the old plant used was found so seriously impaired—with the exception of the drilling platform—as to be practically useless, the discarded hull of the dismantled clam dredge lying at New Westminster was utilized and a better and more effective means for doing the work was secured than formerly in use.

Instructions, under date of July 20, 1900, were received for the immediate removal of Dredger rock, a portion of which had, by work extending over a series of years, been formerly removed. This work was completed on March 2, 1901, but was not thoroughly cleaned up until the return of the *Mud Lark* from Vancouver, when this work was done, as before stated, by May 12. On April 18, instructions were received to begin the work of removal of Tuzo rock. The scows were launched and moved to the site of this work, and the drilling started on May 3. This work has been steadily prosecuted since that date to June 30, but will take some months yet to complete.

The expenditure during the year was \$14,968.80.

#### WILLIAM'S HEAD.

The sum of \$1,924 was expended in repairing the damage done to the wharf by the incoming Canadian Pacific Railway steamer *Empress of China* on February 5, 1901. The responsibility was acknowledged by the Canadian Pacific Railway Company, and the work done by the department. The work was commenced on April 26, and completed on June 21. An additional spur or approach to the centre of the quarantine wharf was also built. This was urgently required as a matter of convenience by Dr. Watt, the officer in charge, to avoid the long detour and delay entailed in sending the bathed and disinfected passengers around to the extreme eastern end of the wharf. It was also a great advantage as a brace or buttress to the wharf to take the impact of these large vessels striking the wharf at its weakest point. This work, together with some 600 feet of cast-iron pipe to replace defective portions of the original line, was completed by the end of June. The pipe line has been found very defective, and is continually developing fresh leaks, and will require from 4,000 to 5,000 feet additional, to make it secure against the chance of collapse. The reservoir also needs attention, the rapid growth of vegetable matter necessitating cutting and cleaning out. This can be done to the best advantage when the water is low and immediately preceding the rainy season, as the risk would be too great to entirely empty the reservoir for the purpose, the water supply being the first essential in the requirements of this station.

#### YUKON.

##### CARIBOU CROSSING.

Caribou crossing and Nares lake divide Lakes Bennett and Tagish.

The place was surveyed, so as to find out the improvements to be made.

The river, especially close to Nares lake, is very shallow, and to give a good depth of water in the steamboat channel, a dam was built.

The dam is 400 feet in length, 10 in width, and 6 in height.



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Two permanent buoys on piers were built at the entrance of the channel, which is also indicated by six floating buoys.

The dam is in good condition, and the object successful.

## FIFTY MILE RIVER.

Three boulders, which were located 8 miles below White Horse town, were removed.

## FIVE FINGERS RAPIDS.

The channel at the Five Fingers, 219 miles below White Horse, passes between two rocks, of over 50 feet in height, and 150 feet apart. The steamboat channel was 40 feet wide and over flat rocks, standing  $1\frac{1}{2}$  foot below low water level, on each side of the channel.

After a survey the west side of the channel was improved giving a better channel of 80 feet, instead of 40; about 7,000 cubic yards of solid rocks were removed.

## HEAD OF LABARGE.

At the entrance of Lake Labarge, the crooked channel is very shallow and surrounded by many sand bars. Not more than  $1\frac{1}{2}$  feet of water is to be found at low water and in many places.

So as to give a straighter and a deeper channel, three dams were constructed to throw the water into a single channel.

One dam, between the main shore and Labarge island, 400 feet in length, consists of brush and rock. This dam was completed and is in good condition.

Two pile work dams, one of 1,400 feet, the other 2,400 feet, which close the present channel at the entrance into the lake, were built.

These dams consist of two rows of piles, 10 feet apart. In the front row the piles are, at every five feet, braced with walings and the other row consists of piles 10 feet apart, braced to the front corresponding piles with cross-pieces.

The space between the piles is to be filled with brush and stone.

Eleven hundred piles are on the ground and 600 feet of the dam are completed with the brush and stone. A large quantity of brush and stone is ready to be used.

The piles are 4 feet above low water and every 40 feet stands a 14-foot pile to indicate the channel.

## SIX MILE RIVER OR TAGISH RIVER.

This river, which divides Lakes Tagish and Marsh, had a channel of good depth, but rendered dangerous by boulders.

After a survey, the boulders were removed and the channel was indicated by floating buoys.

The wharf, built by the North-west Mounted Police, was repaired in 1900.

## THIRTY MILES RIVER.

This river, which runs from Lake Labarge, 59 miles below White Horse, empties into the Lewis river. The water is very shallow, and the channel was covered with boulders which average 5 or 6 tons.

One hundred and fifty-six boulders were removed, and two piers with beacons were built at the discharge of the lake into the river.



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## DREDGING OPERATIONS.

During the fiscal year, 1900-1, dredging was done in the following places :—

## PROVINCE OF NOVA SCOTIA.

Cook's Cove, Guysboro' county.  
 Cribbin's Point, Antigonish county.  
 Milton, Yarmouth county.  
 St. Mary's river, Guysboro' county.  
 Tickle Passage, Little Canso, Guysboro' county.  
 Yarmouth Main Channel, Yarmouth county.

## PROVINCE OF PRINCE EDWARD ISLAND.

Bay View, New London, Queen's county.  
 French river, New London, Queen's county.  
 Summerside, Prince county.  
 Wedlock's wharf, Queen's county.

## PROVINCE OF NEW BRUNSWICK.

Bellisale, King's county.  
 Bent's wharf, Maugerville, Sunbury county.  
 Chipman, Curley's shoal, Queen's county.  
 Chipman and Brigg's corner, Queen's county.  
 Chipman and Ward's shoal, Queen's county.  
 French lake, Oromocto river, Sunbury county.  
 Jemseg, Queen's county.  
 Oromocto shoal, Sunbury county.  
 Spring Hill, York county.  
 St. John harbour, Hilyard Bros. wharf, St. John county.  
 St. John harbour, T. McAvity & Sons' wharf, St. John county.  
 St. John harbour, front I.C. Railway long wharf, St. John county.  
 Upper Sheffield wharf, Sunbury county.  
 Upper Gagetown wharf, Queen's county.  
 Washademoak lake, Queen's county.

## PROVINCE OF QUEBEC.

Chateauguay.	St. Jean des Chaillons.
Coteau Landing.	St. Michel de Bellechasse.
Gatineau River.	St. Nicholas.
Graham.	Valleyfield.
Rivière du Lièvre.	Yamaska.
Richelieu River.	

## PROVINCE OF ONTARIO.

Belleville.	Kingston.
Burlington pier.	Oshawa.
Cobourg.	Ottawa River.
Collingwood.	Port Arthur.
Hamilton.	Port Hope.
Hawkesbury.	Port Stanley.
Kaministiquia River.	South Nation River.
Kincardine.	Trenton.



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## PROVINCE OF MANITOBA.

Red River.

Assiniboine.

## PROVINCE OF BRITISH COLUMBIA.

Columbia River (above Golden).  
Nanaimo.  
Serpentine.

Vancouver.  
Victoria.

## PROVINCE OF NOVA SCOTIA.

## DREDGING AT COOK'S COVE, GUYSBORO' COUNTY.

A fishing and farming settlement in Guysboro' county, 3 miles from Guysboro' and 42 miles from Antigonish, with a population of about 300. The dredge *George McKenzie* continued the dredging from July 1 to September 20, 1900, completing the channel, as directed, to the depth of 10 feet at L.W.S.T., removing the further quantity of 11,920 cubic yards of stone, sand and gravel to a place of deposit, distance 2 miles, at a cost of 45.58 cents per cubic yard.

## DREDGING AT CRIBBIN'S POINT, ANTIGONISH COUNTY.

Eight miles south of Cape George, on the west side of Georges bay, and 5 miles north of Antigonish harbour, is Cribbin's Point wharf, and here the dredge *George McKenzie* was engaged from June 1 to 30, in preparing the bottom to receive a further addition to the present wharf, having at that date removed 2,865 cubic yards of sand, gravel and stone, at a cost of \$1.17.78 per cubic yard. About two weeks will be required to complete the work. The place is much exposed to gales and heavy seas. To perform the work, two tugs were required to be in attendance to remove the dredge and plant to Bayfield, 8 miles distant, for shelter and protection when the weather was unfavourable.

## DREDGING BY HAND AT MILTON, YARMOUTH COUNTY.

A mile above Yarmouth town is the head of navigation, and the village of Milton, where some hand-dredging was being done at the close of the fiscal year 1900. The work was continued from July 1 to 10, 1900, completing the channel to 3 feet, L.W.S.T., at and in front of F. H. Wilson & Company's wharfs, by the removal of the further quantity of 320 cubic yards of sand and mud at a cost of 78.35 cents per cubic yard. There is a population of about 1,500; foundry, post office, stores, &c., and electric street cars connect with Yarmouth town.

## DREDGING AT ST. MARY'S RIVER, GUYSBORO' COUNTY.

St. Mary's river flows into the Atlantic, 112 miles E.N.E of Halifax. Large quantities of deals are shipped from here. At the mouth of the river is a sand bar or shoal about 1,800 feet across, from 15 feet depth outside to 15 feet depth inside the bar. The dredge *St. Lawrence* was engaged from July 11 to November 17, 1900, and from May 3 to June 30, 1901, in dredging this bar to 15 feet at L.W.S.T., removing 47,687 cubic yards of sand, gravel and boulders, at a cost of 32.43 cents per cubic yard, and at the



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latter date about eight weeks would complete the work, according to plan, 200 feet in width. If the passage remains without filling in, it will be of great advantage to vessels using the St. Mary's river.

DREDGING AT TICKLE PASSAGE, LITTLE CANSO, GUYSBORO' COUNTY.

At the eastern entrance, Canso harbour, a cut 450 feet in length, 50 feet in width at bottom, was made through a shoal, increasing the depth of water from 4 feet to 7 feet, L.W.S.T. Also removed boulders from side of channel, largely improving the navigation past Mr. M. Cohon's wharf. The material, 3,015 yards of mud, gravel and boulders, was deposited a mile from the work outside the harbour, at a cost of \$1.48.52 per cubic yard.

DREDGING AT YARMOUTH, YARMOUTH COUNTY.

A county at the western extremity of Nova Scotia, bordering on the Atlantic and intersected by Tusket river. The coasts are deeply indented, and the surface is extremely diversified with mountains, rivers and lakes. Area, 752 square miles. Yarmouth is a seaport town of Nova Scotia, capital of the above county, on a small bay, 88 miles from Annapolis, and 205 miles south-west of Halifax. The surrounding country is fertile and well cultivated. The town contains many fine public buildings, as churches, educational institutions, banks, custom house, post office, hotels.

The channel leading to the wharfs is narrow and circuitous, but well marked with buoys and dolphins. The anchorage within Bunker's island is safe from all winds. The channel has been repeatedly dredged since 1875. The dredging operations were continued, that have been in progress for a number of years, with several intermissions. The work comprises the widening, deepening and otherwise improving the channel from along the water front to deep water in the sound, and a large amount has been done, generally to a depth of 16 feet, L.W.S.T., and the navigation of the harbour has been greatly improved. The total dredged area covers a length of over 1,400 yards, with a width of 20 to 115 yards, some of which has been gone over twice. The dredging has been attended with difficulties and interruptions by vessels getting in the way, the difficulties of turning the dredge each trip in the narrow channel at low water, the long run of 6 miles to deposit, foggy weather, &c. During the fiscal year 1900-1 the dredge *Canada* operated from July 1 to November 24, 1900, removing 29,070 cubic yards, at a cost of 25.41 cents per cubic yard.

THE PROVINCE OF PRINCE EDWARD ISLAND.

DREDGING AT BAY VIEW, NEW LONDON, QUEEN'S COUNTY.

An inlet from New London bay in Queen's county. There is a public wharf and considerable produce shipped, and supplies received at it. The dredge *Prince Edward* was engaged from August 28 to September 5, improving the channel and approach to the wharf, removing 4,095 cubic yards sand and silt at a cost of 46.71 cents per cubic yard, and completing the work and giving improved facilities to shipping.

DREDGING AT FRENCH RIVER, NEW LONDON, QUEEN'S COUNTY.

An inlet from New London bay in Queen's county. The village has a population of about 150 inhabitants. The dredge *Prince Edward* continued the work from July 1



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until August 24, deepening and improving the channel to 10 feet L.W.S.T., and completing the same by the removal of 15,840 cubic yards of mud and silt to a place of deposit at a distance of half a mile. Cost per cubic yard 57:43 cents.

## DREDGING AT SUMMERSIDE, PRINCE COUNTY.

The second town in importance in Prince Edward Island in exports and imports, with an excellent harbour on the Northumberland straits. Steamships from Montreal, Sydney, Newfoundland and Charlottetown touch, and a terminus of the Prince Edward Island Railway is here, connecting with which is the splendid steel steamer *Northumberland*, owned by the Prince Edward Island Steam Navigation Company, and making the daily round trip to Point du Chene, New Brunswick, and connecting with the government Intercolonial Railway there.

In the harbour channel the dredge *St. Lawrence* continued from July 1 to 10th, 1900, cutting through the sand and clay bar, and deepening to 20 feet L.W.S.T., completing the same and making much improvement in the navigation, removing the further quantity of 2,800 cubic yards to a deposit 4 miles distant, at a cost of 26:82 cents per cubic yard. The dredge *Prince Edward* was also engaged in the removal of a middle ground in the harbour, between the channel light and the end of the Prince Edward Island Railway wharf, from October 15 to November 3, and on June 25 and 26 removing 2,025 cubic yards of sand and clay, at a cost of 30:96 cents per yard. At the latter date the dredge was ordered to work at Hurd's Point, and proceeded there.

## DREDGING AT WEDLOCK'S WHARF, QUEEN'S COUNTY.

A wharf adjoining the public wharf at Bay View, where the dredge *Prince Edward* was engaged on September 6, 7, and 8 last removing 1,260 cubic yards of mud and improving the channel leading to said wharf at a cost of 41:30 cents per cubic yard.

## PROVINCE OF NEW BRUNSWICK.

## DREDGING AT BELLEISLE, KING'S COUNTY.

Belleisle point, also called Springfield, a village on Belleisle bay, and about 10 miles north of Kingston, the former capital of the county. The population of the place is about 350. There are flourishing farms in the neighbourhood, and the place is a calling point for river steamers, as the Belleisle is an important and beautiful affluent of the St. John river.

Dredging was done in 1885-6 by the *New Dominion* opening a channel from where 6 feet L.W. summer level was found on the river to the point where the building of a public landing pier was proposed. Again in 1886-7-8 when the site of the pier was removed farther up the bay, the work was continued, improving the channel and forming turning berths, and a basin where vessels could lie afloat and load produce and lumber.

Between September 18 and October 31, 1900, the *New Dominion* again worked in the above channel and berth, removing 14,450 cubic yards of mud and silt at a cost of 22:44 cents per cubic yard, and from October 31 to November 14 the *Clamshell* dredge continued the work, removing 3,285 cubic yards at a cost of 50:75 cents per cubic yard.



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## DREDGING AT BENT'S WHARF, MAUGERVILLE, SUNBURY COUNTY.

Bent's wharf is one of the public piers on the St. John river in Sunbury county, where the steamers running between St. John and Fredericton call to land passengers and freight. From the 19th to the 25th of September the *Clamshell* dredge was engaged deepening the water in front and at the sides of said wharf, removing 2,310 cubic yards of sand and silt, at a cost of 18.54 cents per cubic yard.

## DREDGING AT CHIPMAN, SALMON RIVER, WARD'S SHOAL AND CURLEY'S SHOAL, QUEEN'S COUNTY.

These two shoals are not far removed from each other, near Chipman, Salmon river. The Salmon river, an affluent of the Grand lake is a water way of considerable importance. The dredge *New Dominion* operated on this river deepening over the shoals named, and improving the channel to 9 feet low water summer level.

*Ward's shoal* from July 18 to August 1, removing 5,700 cubic yards of mud, and completing the work. Cost, 14.11 cents per cubic yard.

*Curley's shoal* from the 1st to the 17th of July, removing 5,600 cubic yards of mud to a distance of two miles for deposit at a cost of 15.41 cents per cubic yard, and completed the work.

## DREDGING AT CHIPMAN BRIDGE TO BRIGG'S CORNER, QUEEN'S COUNTY.

Chipman bridge to Brigg's corner is a distance of about 13,300 feet, and near the latter point quantities of lumber are manufactured, which with logs cut and floated down the Salmon river, seek export at St. John harbour.

During the summer season the water in the Salmon river is very shoal, in places merely a rivulet, necessitating the sawn lumber being thrown into the water, and floated below the Chipman bridge, where it is placed in scows or small vessels and taken to St. John for export. Placing the newly sawn lumber in the water causes it to discolour and become dark, while in vessel in transport, therefore deteriorates in value. To remedy this, the dredge *New Dominion* was engaged from April 28 to June 30, and while the freshet remained in the river, improved the same to enable the removal of lumber by barges, and at the latter date had removed 29,300 cubic yards of mud, sand and silt to a place of deposit, at a cost of 11.65 cents per cubic yard, and giving good satisfaction as far as the work had been proceeded with. When the water became too low to permit the dredge doing further work there until the freshet is again in the river, and the dredge proceeded with other work.

## DREDGING AT FRENCH LAKE, OROMOCTO, SUNBURY COUNTY.

French lake is situated on the south side of the Oromocto river, about 7 miles above Oromocto village. Here lumbering, milling, and manufacturing of lumber is carried on, and in the summer season when the water has fallen, it is difficult to get logs and manufactured lumber from the lake to market. To remedy this the dredge *New Dominion* was from the 1st to the 10th of November engaged opening a channel from the river into the lake, and at the latter date on account of the ice making, the work was closed for the season, 3,250 cubic yards of clay and mud having been removed at a cost of 20.71 cents per cubic yard.

The *Clamshell* dredge resumed work on April 22, and at the close of the year, June 30, had removed 21,235 cubic yards of clay and mud at a cost of 14.04 cents, and completing a channel from the river into the lake 1,200 feet in length, 40 feet wide and 8 feet deep at summer water level. Also 20 guide piles were driven on the side of the channel for convenience of warping rafts and vessels.



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## DREDGING AT GAGETOWN (UPPER), QUEEN'S COUNTY.

A point of call for steamers between St. John and Fredericton. Here the *Clamshell* dredge operated from the 6th to the 30th of October, improving the depth of water in front of the wharf by the removal of 1,700 cubic yards of clay and silt. Cost, 64.99 cents per cubic yard, including the driving of four piles at the corners of the wharfs.

## DREDGING AT JEMSEG, QUEEN'S COUNTY.

An affluent of the St. John river from Grand lake. There is considerable traffic on the Jemseg, and a large amount of produce shipped from the settlements on its banks, in addition to coal, lumber and products of the farm passing from the lake and Salmon river.

Steamers call at upper and lower Jemseg villages. The dredge *New Dominion* was here this year from the 4th to the 7th of August, 1900, deepening and improving the channel to 10 feet, low-water summer level, and completing the work. The soil was sand and silt; 600 cubic yards excavated and deposited 2 miles distant; cost per cubic yard, 45.68 cents.

## DREDGING AT OROMOCTO SHOAL, SUNBURY COUNTY.

The River St. John is navigable between the city of St. John and the town of Fredericton for good-sized vessels, drawing as much as 8 feet of water. The principal obstruction is found near Oromocto village, and is called the Oromocto shoal. During the present fiscal year the dredge *Cape Breton* worked on the shoal from May 9 to June 26, improving the channel 4,900 feet in length, over a width of about 50 feet. The quantity of material removed was 63,214 cubic yards of sand, silt and saw-dust, at a cost of 9.61 cents per cubic yards. Place of deposit, 2½ miles distant.

## DREDGING AT SPRINGHILL, ST. JOHN RIVER, YORK COUNTY.

Springhill is about 6 miles above Fredericton, on the St. John river, and here are found a number of shoals which require the attention of the department. The *Clamshell* dredge has operated on the shoal for parts of three seasons. This year, from July 1 to September 18, 1900. The depth required is to 3½ feet, low-water summer level. The swift water and the great quantity of logs and rafts running make the work very difficult and at times dangerous. It is, however, being vigorously pushed; 12,110 cubic yards were removed this year to a place of deposit five-eighths of a mile distant, at a cost of 32.19 cents per cubic yard. The launch *Cricket* in attendance removing the barges.

## DREDGING AT ST. JOHN HARBOUR, WINTER PORT, CITY OF ST. JOHN.

The winter port is situated at the mouth of the St. John river, and owing to the great rise and fall of tide, is free from ice all the year. On the east are two deep-water terminals of the Intercolonial Railway, where the large ocean steamers arrive and take in cargo for the other side of the Atlantic. A large elevator, having all modern equipments for handling grain, has been erected in connection with the Intercolonial Railway terminals and deep-water government piers.

On the west side is the unsurpassed freight terminals of the Canadian Pacific Railway, with a modern elevator, well equipped for handling grain, in connection with the well-appointed piers and freight sheds erected by the City of St. John.



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During the present fiscal year, from August 4 to September 10, and October 30 to December 4, 1900, the dredge *Cape Breton* was engaged in deepening the water in front of the Intercolonial pier to the channel to a depth of 28 feet, L.W.S.T., as conditions would permit. The dredging required to be done as the tides served, a short time each day. Detentions were caused by steamers in the way, boulders and bad weather. In the above-mentioned time, 19,215 cubic yards were removed to a place of deposit 2 miles distant. Cost per cubic yard, 22·85 cents.

#### DREDGING AT McAVITY'S WHARF, ST. JOHN HARBOUR.

The dredge *Cape Breton* was engaged on the 14th and 15th of September deepening and improving to 20 feet depth at L.W.S.T. around McAvity's wharf, an important shipping place in St. John harbour. Fourteen hundred and seventy cubic yards of gravel and mud were removed, at a cost of 22·85 cents per yard.

#### DREDGING AT HILYARD BROS.'S, ST. JOHN HARBOUR.

The dredge *New Dominion* was engaged from the 13th to the 20th of November deepening and improving around Hilyard's wharf in St. John harbour. Fourteen hundred cubic yards of mud were removed, at a cost of 22·43 cents per yard.

#### DREDGING AT UPPER SHEFFIELD, SUNBURY COUNTY.

A point of call for steamers between St. John and Fredericton. Here the *Clam-shell* dredge operated from September 26 to October 5, improving the depth of water in front of the wharf by the removal of 3,830 cubic yards of clay and silt. Cost, 11·10 cents per cubic yard.

#### DREDGING AT WASHADEMOAK LAKE, QUEEN'S COUNTY.

Washademoak, a tributary of the St. John river, which it enters about 35 miles from the city of St. John, and 12 miles below Jemseg. Between Goldings landing and McDonald's point; from the entrance to the Narrows is 12 miles; from the Narrows to Perry's flats is 4 miles. The flats are about 1 mile in length. The surrounding country is well settled and fertile, and considerable produce is shipped from different points on the lake, which is over 20 miles long, and say, 7 to 11 miles in width. The navigation of the lake was obstructed by two shoals, known as Perry's flats, upper and lower, situated about 16 miles from the entrance of the lake to the St. John river.

A dugway made by the New Brunswick government some 39 years ago is about 100 rods in length, very narrow, 20 to 40 feet, crooked and bad at the entrance, having a long sharp point on the lower end, so that vessels have to make a very short turn, nearly at right angles, to get into the cut. The Department of Public Works further improved over these shoals by deepening to 12 feet, straightening and lengthening the channel and widening at the ends. Between August 15 and September 17, 1900, the dredge *New Dominion* further proceeded with the improvement of these shoals, by the removal of 16,700 cubic yards of mud, at a cost of 8 cents per yard. A very large amount of dredging is yet required to complete the work.

#### MARITIME PROVINCE DREDGES.

##### *The Dredge 'St. Lawrence.'*

Beginning of fiscal year, 1900-1, the dredge *St. Lawrence* was operating at Sumner's Point, Prince Edward Island, improving the channel there for winter navigation by



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cutting a channel across a bar to 20 feet L.W.S.T., which it completed by July 10, removing 2,800 cubic yards of sand and clay, and depositing it a distance of 4 miles outside the harbour. At the last mentioned date the *St. Lawrence* was under order for St. Mary's river, Guysboro' county, Nova Scotia. Having coaled and provisioned, it proceeded to St. Mary's river, where it operated until November 17, when orders were received and the dredge proceeded to Halifax on the 18th, and a heavy blow and snow storm coming on, it put into Liscom. 19th arrived at Halifax, and booked for marine slip at Dartmouth. 23rd. Hauled dredge on marine slip, scraped and painted two coats dry red lead and oil, and one coat Peacocks Patent Antifouling paint. Overhauled hopper doors and found wood, rudder and iron loose and part gone. Removed all wood, rudder and iron fastenings and renewed the same. Examined rudder and made necessary repairs. Examined boiler and removed a defective plate, which was replaced by a new plate and extra stay. 18th December. All having been completed that required dredge remaining on slip, it was launched and towed to a berth at the Intercolonial Railway piers at Halifax. 20th. Filled boiler and got steam, and by the 28th had buckets and links removed. Ladder and tumbler secured, and in the evening paid off crew. During the winter the boiler was thoroughly cleaned inside and painted. A new 8-foot wheel put in place of one cracked. Buckets re-riveted and repaired. Links re-bored and new bushed. A set of new bucket pins put in. Engines, condenser, pumps and dredge machinery overhauled and lost motion taken up and renewals made where they appeared necessary. The repairs were quite heavy and expensive. 10th April. Having received instructions the crew were ordered to join, and immediately began placing the buckets on ladder. All repairs being completed, the dredge was coaled and provisioned, and under instructions on the first day of May proceeded to St. Mary's river, Guysboro' county, N.S., where it arrived and resumed dredging on the 3rd, and was continuing the work there on the 17th, when the large driving wheel, 8 feet in diameter, broke. Moorings were lifted, and having a spare wheel in store at Pictou, the dredge proceeded there, removed the broken wheel and put the new in place by the 28th, and was ready to leave, but owing to fog and unfavourable weather, did not arrive at St. Marys river until the 5th of June, when moorings were laid and work continued, and was in progress on the 30th of June. 47,687 cubic yards of sand and gravel being removed during the year and deposited three miles distant.

*The Dredge 'Canada.'*

Beginning of fiscal year was at Yarmouth in the county of Yarmouth, Nova Scotia, improving the harbour channel to a depth of 16 feet L.W.S.T., and by the 24th of November 29,070 cubic yards of mud and shells were removed to a place of deposit, 4½ miles distant. At the latter date, the dredge's boiler having been reported unsafe, the dredge was placed in winter quarters, dismantled, and the crew paid off. A new boiler is being constructed under contract by the New Burrell Johnson Iron Company, Limited. New tube sheet heads have been placed in the condenser. Buckets re-riveted, links re-bushed, new bucket and link pins and keys put on, engines, pumps, winches, steering and dredging gear taken down and repaired ready for work. The dredge was placed on the marine slip. Hull cleaned and painted with two coats dry red lead and oil, and one coat of Peacock's Patent Antifouling paint. Rudder and hopper doors had attention, and bottom plating was examined while on the slip.

*The Dredge 'New Dominion.'*

Beginning of fiscal year, 1900-1, the dredge *New Dominion* was engaged from the 1st to the 17th of July on Curley's shoal, Salmon river, Queen's county, N.B.; from the



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18th of July to the 1st of August on Ward's shoal; from the 4th to the 7th of August on the Jemseg; on the 15th of August it was ordered to the Washademoak, where it worked until the 17th of September; on the 18th of September it was under orders for the Belleisle, King's county, where it was engaged until October 31. At the latter date it was ordered to French lake, Sunbury county, and was there employed until the 10th of November, when ice began to make, and the plant was removed to St. John harbour, and worked from the 13th to the 20th of November at Messrs. Hilyard Brothers' wharfs. Orders being now received, the dredge was placed in winter quarters, dismantled and the crew paid off. Dredge was idle seven days by broken machinery in September, at the Belleisle: boiler and water-tanks repaired and painted; dredge bucket and locket repaired; engines, pumps and dredging machinery taken down, repaired and put in place again; a new smoke stack was put in place. 15th April. Shipped crew, coal and provisions, caulked dredge and repaired four mud scows. All being now ready, and as the freshet in the river was rising rapidly, fears were entertained that it would so rise that the falls would not permit taking the plant through and up the river until the freshet receded, and to avoid this emergency, the dredge and plant were at once taken through the falls to await orders for work. 25th April. Received orders to proceed to Salmon river, Grand lake, and there take up the improving of the channel between the Chipman bridge and Brigg's corner. This was done, and dredging began on the first day of May, and was being continued at the close of the year, 77,000 cubic yards having been removed by this dredge during the fiscal year.

*The Dredge 'Prince Edward.'*

Beginning of present fiscal year at French river, New London, Queen's county, P.E.I.; continued the work of opening the channel into French river, and completed the same by the 24th of August, and, under orders, immediately removed to Bay View, and was engaged there from the 28th of August to the 5th of September, and completed the channel; also from the 6th to the 8th of September, improving the channel to Wedlock Bros.' wharf. Dredge under orders and making ready to leave for Summerside. 15th. Tugs arrived, but weather unfit to leave. 20th. Left Bay View; at Kildare cape met storm and returned to Alberton for shelter. 26th. Left Alberton. 27th. Arrived at Summerside, and preparing dredge for work. 11th October. Began dredging on Middle Ground. 3rd Nov. Bottom casting of crane broken. Weather has been unfavourable for work; removing anchor posts and crane for repair. 17th. Received orders to pay off crew and haul dredge out for repairs at Summerside. This was a difficult job. The most suitable place to be got for hauling the dredge and scows was leased; lumber and ways procured from different parts of the island, and by the 31st of December ways had been laid and the dredge and four scows hauled out of the water and blocked ready for examination and repair. On examination, the keelsons, part of the frame, anchor housings and dredging end of dredge were found to be badly worn and broken. To make repairs, crane, anchor posts and much of the machinery had to be removed, and the boiler lifted; then the rotten timbers and fastening removed, and in doing so, part of the copper sheathing had to be taken off. After it was found what was required, timbers, plank and other lumber had to be procured from the woods, and was very difficult to get on the island. The four scows were much worm-eaten and required re-caulking, new door-hinges, &c. 25th February. Began repairs. 25th June. Repairs and renewals completed and crew shipped; dredge resumed work on the middle ground, in Summerside harbour. During the fiscal year 23,220 cubic yards were removed by this dredge.



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*The Dredge 'George McKenzie.'*

Beginning of fiscal year, this dredge was engaged opening a channel into Cook's cove, Guysboro' county, which it completed the 20th of September, and was under orders for Tickle passage, Little Canso, Guysboro' county, N.S., where it arrived on the 25th of September, and on the 23rd of November had completed improving the passage there; at the latter date it was under orders for winter quarters at Port Hawkesbury, Richmond county, N.S., where it arrived, and on the 15th of December dredge and four mud scows and water scows were placed on the marine slip, Point Tupper, where necessary repairs, alterations and renewals were made. On the 29th of March orders were: 'At the opening of navigation this dredge is to be placed at work at Point Tupper and Mulgrave, to perform the dredging required at the Intercolonial Railway termini at these two places.' Dredge and scows were launched on the 17th of April; coaled, provisioned and all ready for work, with crew on board, and tug in attendance by the 27th, when orders were received: 'Services of dredge *Geo. McKenzie* not required at Mulgrave or Port Hawkesbury. Place her at work at Cribbin's point for dredging foundation, proposed wharf there; then in harbour, Cheticamp. Employ tug *Shannon*.' Preparation was made for sending the dredge to Cribbin's point, when, on the 3rd of May, orders were received to 'send *Geo. McKenzie* to Cheticamp until further orders.' The dredge was again dismantled and made ready for the voyage, and the tug *Goliath*, of Halifax, engaged to make the tow there. Coming out of Halifax, the *Goliath* met fog and went ashore, damaging it so it had to return and repair. Her engagement was cancelled, and the tug *A. C. Whitney* engaged. On the 18th of May orders were received: 'Have dredge *Geo. McKenzie* stop at Cribbin's point on way to Cheticamp.' This was done, and on arriving there, as the place was exposed and dangerous, and required that in rough weather the plant be removed to Bayfield, 8 miles distant, it became necessary to retain the services of the two tugs, *A. C. Whitney* and *Shannon*. This was done, and the work proceeded with and was well advanced at the close of the fiscal year. Seventeen thousand eight hundred cubic yards were removed.

*The Dredge 'Cape Breton.'*

Beginning of present fiscal year the dredge *Cape Breton* had completed the dredging to 28 feet L.W.S.T., at the city winter port piers, St. John west, and was sheathing houses and making ready to leave for Halifax. Waiting orders for tugs. 25th July. Orders received to dredge in front the Intercolonial new pier and slips, long wharf, East St. John, to the channel. Removed the sheathing from dredge houses; again put machinery in place in working order. While doing this and fitting plate in friction box on crane, the sling chain holding outer end of boom broke and damaged plate and stay on the bucket handle, the handle going to the bottom. By the 4th of August repairs were completed and moorings laid for work at the Intercolonial Railway, and work continued until the 13th of September, when dredge being in the way of Messrs. Connolly, the contractors for the new pier, it was removed to Messrs. McAvity's wharf for two days' work which was completed. 16th. The dredge was removed to St. John west. Bucket and barges were prepared for holding fine sand. 30th October, received orders to proceed with dredging in front of Intercolonial Railway pier, which was immediately commenced, and continued until the 4th of December, as wind and weather would permit. As the work interfered with the ocean steamers arriving at the Intercolonial Railway wharf, the Intercolonial Railway department asked that the dredging be discontinued, which was done, and the dredge and plant removed to winter quarters; crew paid off on the 12th of December. Began repairs to boiler, crane, swing-



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ing engines, condenser, separators, main engines and dredging machinery, all of which had attention, and by the 1st of May were in thorough repair, and all ready for work. 3rd May. Received order to send dredge to work on the Oromocto shoals, Sunbury county, St. John river, N.B. Crew were shipped, coal and provisions put on board, and the 8th of May dredge and plant proceeded through the falls, and arrived on the shoals on the 9th, and started work on the 11th of May, which was continued with good effect until the 26th of June, when the water had fallen too low in the river for tugs and barges to make deposit, and orders were given and the plant left for St. John to take up the work in front the Intercolonial Railway pier there. The dredge and plant arrived at Indiantown. Fog being too dense to go through the falls, they were in waiting there at the close of the fiscal year. Eighty-three thousand eight hundred and eighty-nine cubic yards were removed by this dredge during the year.

### *The 'Clamshell' Dredge.*

Beginning of fiscal year this dredge was awaiting repairs to the tug *Cricket* at Springhill, York county, N.B. Repairs being completed, work was resumed by the dredge at Springhill, and continued until the 15th of September, when water had fallen so low, the tug was unable to work removing scows. Orders were received and the dredge removed to Maugerville wharf, Sunbury county, N.B., where the work of improving the depth of water in front the wharf at that place was commenced on the 19th, and completed on the 25th of September. Orders were then received and an attempt made to drive piles in front of the public wharf at Burton, Sunbury county, N.B., but striking rock, driving the piles had to be abandoned. Orders were then received and the plant removed to upper Sheffield, and the depth of water in front of the Sheffield wharf improved until the 5th of October when it was completed, and under orders, the plant was removed to upper Gagetown, where work was commenced on the 6th, and continued to the 31st of October, improving the channel and driving piles in front of the wharf; when orders were to proceed to Belleisle in Kings county, N.B., which was done, and the dredge and plant arrived, and worked from the 1st until the 14th of November, improving the channel and around the two public wharfs at the Belleisle; ice making, the dredge and plant left for St. John, where it arrived on the 17th, and was placed in winter quarters. Crew paid off.

During the winter, engines, pumps, and all machinery were overhauled, repaired and slack motion taken up, water tanks put in, raft and log shunter placed on the dredge's bow, dredge and scow caulked, boiler of dredge and pile-driver had attention, and all being in readiness, orders were received and the dredge and plant left for French lake, Sunbury county, N.B., on the 20th, and by the 24th of April was at work cutting a channel from the Oromocto river into the French lake, and at the close of the fiscal year only required a few days to complete the channel, twenty guide or warping piles were driven on the side of the channel. Forty-four thousand four hundred and seventy cubic yards were removed during the year.

### *The Steam Launch 'Cricket.'*

Attended the Clamshell dredge during the year, except when it was laid up for repairs to hull and placing of new pipes in the boiler. By July 23, 1900, repairs were completed and the *Cricket* in attendance, which continued until it went into winter quarters. During the winter the hull, engine and boiler had attention, and during the present season did excellent work.



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HAND-DREDGING.

Beginning of fiscal year, hand-dredging at Milton, in Yarmouth county, N.S., was being continued, and with two scows and a number of men, 320 cubic yards of mud and stone were removed from the channel in front of Messrs. F. H. Wilson & Company's wharfs by the 10th of July, and the work completed.

MEMORANDUM of quantities removed by the several dredges in the Maritime Provinces during the fiscal year, 1900-1.

	Cubic yards.
' St. Lawrence '.....	50,487
' Canada '.....	29,070
' New Dominion '.....	77,000
' Prince Edward '.....	23,220
' Geo. McKenzie '.....	17,800
' Cape Breton '.....	83,899
' Clamshell ' .....	44,470
Hand-dredging.....	320
	— — — —
Total.....	326,266



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DREDGING MARITIME PROVINCES.

CLASSIFICATION of Disbursements of the Dredges operated by the Public Works Department during the Year ended June 30, 1904.

DREDGE "ST. LAWRENCE."

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Total.
	£ cts.	£ cts.	£ cts.	£ cts.	£ cts.	£ cts.	£ cts.	£ cts.	£ cts.	£ cts.	£ cts.	£ cts.	£ cts.
Wages.	461 66	478 36	483 33	483 33	472 30	426 31	262 33	197 14	165 00	340 34	483 33	482 36	4,736 29
Coal.	426 87	28 40	551 40		157 00	97 71				247 50	534 25		2,043 13
Provisions.	144 06	93 03	76 68	157 11	142 85	78 61				34 93	168 68	155 34	1,051 29
Stores.		18 95		0 70	10 33				65 54	62 88	135 15	52 71	346 26
Equipment.	418 75	8 49		73 80	28 38					36 56		7 50	573 39
Water.	6 75	7 50	4 65		6 75						32 40		58 05
Repairs.				52 55		2,590 14	1,229 36	543 06				1,193 52	5,579 23
Pilotage.	101 00	81 00	75 00	81 00	57 00	15 00					85 09	75 00	555 09
Towage.	7 50										50 00	43 00	15 00
Wharfage.	70 79	1 80	9 00	1 79	21 33		13 46		2 83		8 25	45 05	214 75
Contingencies.													174 30
Totals.	1,637 58	752 89	1,200 00	911 28	913 94	3,297 77	1,505 15	711 10	233 37	722 21	1,497 15	2,054 48	15,346 78
Working expenses.	1,637 38	752 89	1,200 00	898 73	913 94	3,297 63	13 46		233 37	722 21	1,497 15	800 96	9,307 78
Repairs, ordinary.				52 55		2,590 14	91 00					1,193 52	3,927 21
D. V., repairs and maintenance.							1,400 69	711 10					2,111 79
Totals.	1,637 38	752 89	1,200 00	911 28	913 94	3,297 77	1,505 15	711 10	233 37	722 21	1,497 15	2,054 48	15,346 78



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DREDGE CANADA

Wages	425 00	420 00	417 19	419 31	225 56	191 73	212 00	212 00	229 95	212 00	242 15	3,026 88
Coal	163 67	300 87	168 27	225 48								1,053 93
Provisions	91 13	89 89	48 16	49 84	77 56							442 23
Stores	14 06	6 81	14 78	54 82	10 78		2 45	11 06		8 61	73 71	197 08
Equipment											14 00	94 14
Water	4 86		5 94	2 94								29 88
Repairs	162 34	13 39	168 68	61 66	120 72	4 85				19 68	611 40	1,215 84
Pilotage	52 00	54 00	54 00	44 00							14 00	254 00
Towage	5 00											19 00
Wharfage												
Contingencies	1 34	1 78	2 25	7 92	6 51		22 10	9 84		4 36	3 20	59 30
Totals	918 80	886 74	819 27	878 57	441 12	196 59	236 55	232 90	229 95	244 65	958 46	6,992 28
Working expenses	756 46	873 33	650 59	816 91	320 40		24 55	232 90	229 95	224 97	295 10	5,329 75
Repairs ordinary	162 34	13 39	168 68	61 66	120 72					19 68	341 60	941 18
D. V. repairs and wintering						196 59	212 00				321 76	730 35
Totals	918 80	886 74	819 27	878 57	441 12	196 59	236 55	232 90	229 95	244 65	958 46	6,992 28

DREDGE NEW DOMINION

Wages	358 15	360 18	372 47	341 35	130 00	170 00	130 60	256 40	407 11	370 00	370 00	3,644 66
Coal	122 59		195 00						240 97	144 00	144 00	702 36
Provisions	62 71	99 46	90 87	28 13	4 33				138 24	43 66	60 79	500 67
Stores					7 78				43 21	22 67	11 45	85 11
Equipment											151 65	151 65
Water			60 12		39 25	123 73	48 93		23 50		69 61	62 75
Repairs					32 73				81 39			416 51
Pilotage												
Towage	520 00	665 00	1,520 00	500 32						809 00	500 00	5,048 72
Wharfage												
Contingencies					12 77			5 86			6 54	25 17
Totals	1,063 25	1,133 64	2,238 46	878 80	226 86	293 73	178 93	262 26	934 42	1,245 33	1,314 04	10,697 69
Working expenses	1,063 25	1,133 64	2,178 34	878 80	194 13			262 26	833 03	1,245 33	1,244 43	9,981 09
Repairs ordinary			60 12		32 73		48 93		81 39		69 61	292 78
D. V. repairs and wintering						293 73	130 00					423 73
Totals	1,063 25	1,133 64	2,238 46	878 80	226 86	293 73	178 93	262 26	934 42	1,245 33	1,314 04	10,697 69







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DREDDGE AND GEO. MCKENZIE

Wages	384 50	384 50	378 41	384 25	378 00	133 52	162 50	313 50	664 50	100 00	391 89	393 75	1,378 99
Coal			36 20									71 17	95 35
Provisions	71 06	178 58	92 70	93 88	71 50						191 76	89 07	792 00
Stores	11 20						1 20				50 46	28 57	91 43
Equipment	9 86		11 71							11 87	28 84	62 46	154 71
Water	75 00	81 00	70 56	81 00	45 00							72 00	424 50
Repairs		27 56	5 17	15 02		14 87		99 17	1 9 90			324 68	846 41
Pilotage													
Towage	575 00	675 00	625 00	675 00	885 00	15 00					675 00	1,470 00	5,395 00
Wharfage												70 00	70 00
Contingencies	2 33	9 20	10 54	5 61	8 91	9 18	0 95		18 17		12 82	7 99	117 71
Total	1,131 95	1,355 73	1,220 23	1,254 76	1,380 13	172 77	164 63	412 65	842 63	453 94	1,383 71	2,790 99	12,572 32

Working expense  
Repairs, ordnance,  
D. V., repair and  
watering

Totals	1,131 95	1,355 73	1,220 23	1,254 76	1,380 13	172 77	164 63	412 65	842 63	453 94	1,383 71	2,790 99	12,572 32
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CAPT. BRETON

Wages	435 48	435 00	435 00	435 00	430 27	299 81	140 00	140 00	180 00	228 76	421 30	433 72	1,934 43
Coal			107 85		95 71						416 02	89 55	709 60
Provisions	120 67	68 34	30 75	63 92	83 67	132 00					104 77	112 49	700 61
Stores	86 95				10 46	16 56	5 25	6 50		4 34	12 46	33 89	176 34
Equipment	38 14				115 38	111 10						176 43	479 55
Water						73 80			38 50	13 58		33 50	109 58
Repairs	81 88	92 70	429 22	56 15		56 88		223 11	9 42			65 94	1,015 00
Pilotage													
Towage	10 00	436 00	209 50		196 50	19 50					390 00	1,880 50	2,987 00
Wharfage													
Contingencies													
Total	773 45	1,022 04	1,212 32	545 07	932 03	741 82	140 00	268 56	234 12	246 68	1,154 64	2,823 11	10,233 67

Working expense  
Repairs, ordnance,  
D. V., repair and  
watering

Totals	773 45	1,022 04	1,212 32	545 07	932 03	741 82	140 00	268 56	234 12	246 68	1,154 64	2,823 11	10,233 67
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DREDGING MARITIME PROVINCES *Continued.*  
CLASSIFICATION OF DISBURSEMENTS of the Dredges operated by the Public Works Department, &c. *Continued.*

DREDGE "CLAM SHELL"

ITEMS.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Grand Total.	
	%	cts.	%	cts.	%	cts.	%	cts.	%	cts.	%	cts.	%	cts.	%	cts.	%	cts.	%	cts.	%	cts.	%	cts.		
Wages.	424	50	462	33	478	22	482	60	345	13	100	00	240	25	191	00	307	90	360	83	345	00	345	00	4,082 76	
Coal.	80	75			112	50					2	55							241	61			147	54	584 95	
Provisions	186	40	208	07	210	05	218	20	129	15									15	55	202	92	141	46	1,311 50	
Stores.	6	00			14	50	32	41	5	85	87	88			7	66			232	98	16	50	4	38	149 09	
Equipment			98	00	111	05			6	25																
Water	70	92					6	25	119	30	234	95	531	20	99	49	30	85	10	21	38	55	30	55	219 45	
Repairs					33	58																	12	50	12 50	
Pilotage	178	82	230	11	296	94	188	65	882	25											327	17	130	72	2,204 64	
Towage																										
Wharfage	34	30									6	32					9	35				4	00	4	97	58 94
Contingencies																										
Totals.	982	50	995	51	1,250	44	928	12	1,488	02	381	70	771	45	298	15	357	08	650	88	934	14	901	64	9,942 72	
Working expenses.	911	67	995	51	1,196	86	921	87	1,308	63	146	75			7	66	317	25	610	67	895	59	817	12	8,222 58	
Repairs, ordinary.	70	92			53	58	6	25	119	30	234	95	370	70	99	49	7	60	10	21	38	55	84	52	1,096 16	
D. V. repair and wintering.													400	75	191	00	32	25							623 98	
Totals	982	50	995	51	1,250	44	928	12	1,488	02	381	70	771	45	298	15	357	08	650	88	934	14	901	64	9,942 72	







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DREDGING MARITIME PROVINCES (Continued).

Quantities of Material removed by Dredges operated by the Public Works Department, &c. (Continued).

DREDGE "ST. LAWRENCE."

Description of Material Dredged	Month												Grand Total.
	Jan.	Feb.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
Hard pan													
Gravel and sand													
Sand													
Silt													
Sand and clay.													
Silt and clay.													
Mud													
Totals	10,150	16,160	7,700	3,957	1,050								50,157

DREDGE "CANADA."

Hard pan													
Gravel													
Clay													
Clay and stone													
Sand exclusively.													
Sand very fine													
Mud and shells													
Totals	6,650	8,550	6,300	5,670	1,890								29,070



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DREDGE - NEW DOMINION

Clay				3,250			3,250
Sand and gravel				5,750			5,750
Sand, mud and shell				1,700			1,700
mud.	400						900
Clay and sand				1,150			1,150
Clay and mud						100	15,300
Sand	8,100	1,000			15,000		38,400
Sand and mud	1,050			2,750			3,800
Mud	1,350	8,800	7,900				18,950
Totals	10,900	9,800	11,000	11,350	15,000	400	77,000

DREDGE - GEO. MCKENZIE

Hard pan							
Boulders, stone and gravel	650			270	2,295		3,705
Gravel, sand and stone	2,770	960		80		2,515	6,325
Clay	3,355	1,600	2,465			550	7,420
Stone and gravel							50
Sand and gravel							
Sand very fine							
Mud							
Totals	6,815	2,560	2,815	2,295	450	2,815	17,800

DREDGE - CAPPE BRETON

Hard pan							
Boulders, sand and gravel					7,065		7,065
Gravel							
Loess, boulders and mud			1,470				1,470
Clay and stone							
Sand and gravel					9,450	34,254	43,684
Sand very fine					11,865		11,865
Mud		10,500	3,150				19,215
Totals		10,500	4,620		28,980	34,234	83,849



1-2 EDWARD VII., A. 1902

DREDGING MARITIME PROVINCES—Continued.  
Classification and Quantities of Material removed by Dredges operated by the Public Works Department, &c. Continued.

DREDGE "PRINCE EDWARD."

Description of Material dredged.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.
Hard pan . . . . .													
Boulders . . . . .													
Gravel . . . . .													
Clay . . . . .													
Clay and stone . . . . .													
Sand—ordinary . . . . .													
Sand—very fine . . . . .													
Mud and sand . . . . .	7,110	10,575	3,510	1,755	135							135	23,220
Totals . . . . .	7,110	10,575	3,510	1,755	135							135	23,220

DREDGE "CLAM SHELL."

Description of Material dredged.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.
Hard pan . . . . .													
Shell rock and clay . . . . .				625									625
Gravel . . . . .	3,810	1,680	120										5,610
Clay and gravel . . . . .		1,200		1,075									2,275
Clay and sand . . . . .			3,935	2,205	1,215								7,355
Sand and gravel . . . . .			2,300							2,160			2,300
Clay . . . . .					2,070						8,995	10,080	2,160
Mud and clay . . . . .													21,115
Totals . . . . .	3,810	5,880	6,355	3,905	3,285					2,160	8,995	10,080	44,170



## SESSIONAL PAPER No. 19

DELIVERING BY HAND.







## SESSIONAL PAPER No. 19

Clam Shell.	T. McAvity & Son's Wharf, St. John, St. John Co., N.B., Oronoco Shoal, Sumbury Co., N.B.,	Sept. 14 and 15, 1900, May 9 to June 26, 1901	8 334	00 30	1,470 63,214	185 71 3,350 82	0 12 63 0 05 31	150 19 2,717 30	335 90 6,077 12	0 00 00 0 00 61	22
	Springhill, York Co., N.B., Port's Wharf, Margerville, Sumbury Co., N.B.	July 1 to Sept. 18, 1900.	440	00	12,110	2,439 25	0 20 14	1,459 01	3,898 26	0 32 13	13
	Upper Sheffield, Sumbury Co., N.B., Upper Gagetown, Queen's Co., N.B., Bellevue, King's Co., N.B. French Lake, Sumbury Co., N.B.	Sept. 19 to 25, 1900 Sept. 26 to Oct. 5, 1900 Oct. 6 to 30, 1900. Oct. 31, to Nov. 14, 1900 April 22 to June 30, 1901	49 72 187 83 345	00 00 30 30 00	2,310 3,830 1,700 3,285 21,235	268 09 266 01 791 55 1,043 20 1,866 52	0 11 60 0 06 94 0 40 66 0 31 75 0 08 79	160 35 159 11 413 55 623 98 1,116 45	425 44 425 15 1,104 90 1,667 18 2,982 55	0 18 54 0 11 10 0 64 99 0 50 72 0 11 61	54
			5801	10	325,946	45,945 28	0 13 81	42,695 31	87,740 59	0 26 91	91



DREDGING MARITIME PROVINCES—Continued.

EXPENDITURE for Dredging in Nova Scotia for the twenty-nine Years ended June 30, 1901.

		Total for the Twenty-eight Years ended June 30, 1900.				For the Year 1900-01.				Total		Cost for each County.	
County.	Locality.	Quantity.		Cost.		Quantity.		Cost.		Quantity.	Total Cost.		
		c. yds.	s.	cts.	County.	c. yds.	s.	cts.	County.				
Antigonish.	Antigonish.	22,025	3,649	15						22,025	3,649	15	
	Harbour au Bonche	59,243	19,703	33						59,243	19,703	33	
	Tracadie.	12,245	5,530	29						12,245	5,530	29	
	McNair's Cove.	11,265	10,035	68						11,265	10,035	68	
	Bayfield	12,871	9,505	79						12,871	9,505	79	
	Amalg.	8,230	7,452	26						8,230	7,452	26	
Annapolis.	Crabbin's Point		55,876	50		2,865	3,374	49		2,865	3,374	49	59,250 99
	Annapolis.	2,825	1,635	68						2,825	1,635	68	1,635 68
Cape Breton.	Lanzon.	22,267	9,275	56						22,267	9,275	56	
	Sydney.	54,000	17,781	54						54,000	17,781	54	
	Little Glace Bay	46,450	16,936	02						46,450	16,936	02	
	Port Caledonia.	17,413	8,242	21						17,413	8,242	21	
	Bonaville Pond	20,800	5,993	90						20,800	5,993	90	
	Christmas Island	19,045	3,361	98						19,045	3,361	98	
Columbia.	Claw Bay.	3,255	1,892	32						3,255	1,892	32	
	Maina Point	4,680	2,720	76						4,680	2,720	76	66,207 29
	Tatamagouche.	65,480	20,373	07						65,480	20,373	07	20,373 07
	Paradise.	42,595	12,804	68						42,595	12,804	68	
	Wallace.	93,865	24,140	37						93,865	24,140	37	36,945 05
	Dorby	12,585	5,056	29						12,585	5,056	29	
Cumberland.	Weymouth	88	28	62						88	28	62	5,084 91
	Gray's River	5,400	1,413	53						5,400	1,413	53	
	Port Mulgrave.	47,650	16,519	85						47,650	16,519	85	
	Shubenacke.	4,347	2,494	81						4,347	2,494	81	
	Cook's Cove	1,260	496	49						1,260	496	49	
	St. Mary's River	4,895	1,903	15						4,895	1,903	15	
Dorchester.	St. Mary's River		11,920	5,433	14								
	Tickle River.		47,687	15,466	54								
	Little Canso.		3,015	4,177	97								
			22,827	83									
													48,205 48

1-2 EDWARD VII., A. 1902







DREDGING MARITIME PROVINCES *Continued.*

EXPENDITURE for Dredging in Nova Scotia for the twenty nine Years ended June 30, 1901. *Concluded.*

1-2 EDWARD VII., A. 1902

County	Locality.	TOTAL FOR THE TWENTY EIGHT YEARS ENDED JUNE 30, 1900.				FOR THE YEAR 1900-01.				Total Quantity.	Total Cost.		Cost for each County.
		Quantity.		Cost.		Quantity.		Cost.			Quantity.		
		c. yds.	\$ cts.	\$ cts.	\$ cts.	c. yds.	\$ cts.	\$ cts.	\$ cts.		c. yds.	\$ cts.	
Richmond	DRBourse	23,650	10,052 76							23,650	10,052 76		
	St. Peter's Channel	90,830	27,435 95							90,830	27,435 95		
	St. Peter's	7,150	2,407 41							7,150	2,407 41		
	Grand Coudet	23,584	5,570 49							23,584	5,570 49		
	River Bougeois	18,920	4,468 87							18,920	4,468 87		
	Marine Ship.	320	56 53							320	56 53		
	Poulinville.	10,080	2,566 14							10,080	2,566 14		
Shelburne	Pouchin Harbour	16,875	9,454 94	62,013 09						16,875	9,454 94	62,013 09	
	Leekport	75,358	18,026 86							75,358	18,026 86		
	Barrington Passage	40,780	13,123 31							40,780	13,123 31		
	Ostadin	990	145 31							990	145 31		
	Wood's Harbour	1,170	245 45							1,170	245 45		
	Barrington Public Wharf and Sher- rows Channel	9,090	1,074 02	32,614 95						9,090	1,074 02	32,614 95	
Yarmouth	Yarmouth, Milton	363,682 343	99,600 43 248 71			29,070 320	7,380 03 250 75			392,752 663	107,019 46 449 46		107,548 92
	Windon.	5,450	1,627 60							5,450	1,627 60		1,627 60
Victoria.	Alva Bay	3,820	1,500 95							3,820	1,500 95		1,500 95
Dredging Costs			762 98								762 98		762 98
		2,471,909	771,777 53	771,777 53		91,875	36,391 92			2,566,786	808,169 45		808,169 45



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EXPENDITURE for Dredging in Prince Edward Island for the twenty nine Years ended June 30, 1901.

King's	Grand River	76,170	15,304 04	76,170	15,304 04
	Montague River	132,480	22,819 11	132,480	22,819 11
	Murray Harbor South	99,453	17,638 73	99,453	17,638 73
	Sturgeon	16,026	6,066 27	16,026	6,066 27
	St. Mary's wharf	21,963	4,752 55	21,963	4,752 55
	Georgetown Railway wharf	1,002	408 32	1,002	408 32
	Cardigan bridge	35,955	8,619 36	35,955	8,619 36
	Newport	3,240	917 82	3,240	917 82
	Souris	3,825	1,083 53	3,825	1,083 53
			77,609 73		77,609 73
Queen's	Charlottetown Railway wharf	86,151	22,162 30	86,151	22,162 30
	Pownd wharf	14,193	2,963 50	14,193	2,963 50
	Ferry	10,075	2,006 99	10,075	2,006 99
	Steam Nav. Co	13,113	5,491 77	13,113	5,491 77
	Connolly's wharf	9,978	4,409 68	9,978	4,409 68
	Peake Bros	12,195	5,362 46	12,195	5,362 46
	Queen Street slip	3,915	1,109 03	3,915	1,109 03
	Geo. Peake's wharf	5,805	1,644 42	5,805	1,644 42
	Poole's wharf	12,240	1,609 95	12,240	1,609 95
	McMullan's wharf	6,165	1,320 13	6,165	1,320 13
	Port building sewer	5,855	1,146 68	5,855	1,146 68
	Public sewerage	2,880	679 12	2,880	679 12
	Webster's Corner, East River	263	43 17	263	43 17
	Chapaud, Victoria	109,652	31,747 99	109,652	31,747 99
	Pownd Bay	33,610	6,536 20	33,610	6,536 20
	Rocky Point	82,920	13,426 13	82,920	13,426 13
	Vernon River	17,860	6,326 72	17,860	6,326 72
	Wood Island	2,780	548 00	2,780	548 00
	Nine Mile Creek	31,650	6,286 46	31,650	6,286 46
	Hickey Wharf	750	150 51	750	150 51
	Car's Point	12,165	2,441 28	12,165	2,441 28
	Puette	3,825	756 24	3,825	756 24
	Port Augustus	3,195	631 68	3,195	631 68
	Southport ferry	45,300	7,508 75	45,300	7,508 75
	Red Point	7,161	3,879 60	7,161	3,879 60
	North Rustico	13,536	4,775 38	13,536	4,775 38
	South Rustico	11,649	4,109 67	11,649	4,109 67
	Gauthier Creek	17,847	8,305 50	17,847	8,305 50
	Malpeque	28,575	3,483 32	28,575	3,483 32
	French River	25,831	4,213 98	25,831	4,213 98
	Bay View			15,840	9,097 48
	Woodlucks			4,095	1,912 87
				1,260	520 48
				175,076 91	11,530 83
					166,607 74



1-2 EDWARD VII., A. 1902

DREDGING MARITIME PROVINCES. *Continued.*  
EXPENDITURE for Dredging in Prince Edward Island for twenty-nine Years ended June 30, 1901—*Continued.*

TOTAL FOR THE TWENTY-EIGHT YEARS ENDED JUNE 30, 1900.										FOR THE YEAR 1900-1901.									
County.	Locality.	Quantity.		Cost.		Cost for County.		Quantity.		Cost.		Cost for County.		Total Quantity.		Total Cost.		Cost for each County.	
		c. yds.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	c. yds.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	c. yds.	\$ cts.	\$ cts.	\$ cts.				
Prince	Summerside	84,136	19,221 15	.....	.....	.....	.....	4,825	7,453 30	.....	.....	.....	.....	88,061	26,674 45	.....	.....	.....	
	Hunts Point Pier	59,295	11,913 99	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59,295	11,913 99	.....	.....	.....	
	Tignish	11,387	13,005 45	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11,387	13,005 45	.....	.....	.....	
	Cascapoe	1,157	338 42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,157	338 42	.....	.....	.....	
	Cape Traverse	16,740	5,105 89	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16,740	5,105 89	.....	.....	.....	
	Holman wharf	9,585	1,269 21	51,054 11	.....	.....	.....	.....	.....	.....	.....	.....	7,453 30	9,585	1,269 21	58,507 11	.....	.....	
		1,202,988	283,740 75	283,740 75	28,984 13	26,020	18,984 13	1,229,008	302,724 88	302,724 88	302,724 88	302,724 88	302,724 88	1,229,008	302,724 88	302,724 88	302,724 88	302,724 88	

EXPENDITURE for Dredging in Quebec for the twenty nine Years ended June 30, 1901. (From Appropriations Maritime Provinces.)

County	Locality.	Quantity.		Cost.		Quantity.		Cost.		Quantity.		Cost.		Total Quantity.	Total Cost.	Cost for each County.
		c. yds.	\$ cts.	\$ cts.	\$ cts.	c. yds.	\$ cts.	\$ cts.	\$ cts.	c. yds.	\$ cts.	\$ cts.	\$ cts.			
Magdalen Island, Co.	Houso Harbour	6,800	2,392 92	.....	.....	.....	.....	.....	.....	6,800	2,392 92	.....	.....	6,800	2,392 92	.....
	Andinet Harbour	495	242 05	2,634 97	.....	.....	.....	.....	.....	495	242 05	.....	.....	495	242 05	2,634 97
Terniscouata	River du Loup	2,587	825 47	.....	.....	.....	.....	.....	.....	2,587	825 47	.....	.....	2,587	825 47	.....
	Rimouski	8,123	3,997 59	3,997 59	.....	.....	.....	.....	.....	8,123	3,997 59	.....	.....	8,123	3,997 59	3,997 59
		18,005	7,458 03	7,458 03	.....	.....	.....	.....	.....	18,005	7,458 03	.....	.....	18,005	7,458 03	7,458 03



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EXPENDITURE for Dredging in New Brunswick for the twenty nine Years ended June 30, 1901.

Gloucester Kent.	Bathurst	98,637	29,095 79	98,637	29,095 79	29,095 79
	Richibucto	140,228	44,001 19	140,228	44,001 19	44,001 19
	Chicopee	27,180	9,601 45	27,180	9,601 45	9,601 45
	Bractonche	13,005	4,934 24	13,005	4,934 24	4,934 24
King's	Prists' Point	3,510	1,110 70	3,510	1,110 70	1,110 70
	Chapel Point	4,140	1,310 07	4,140	1,310 07	1,310 07
	Robertson's wharf	45	14 23	45	14 23	60,971 88
	Bellerisle Point	60,170	8,156 76	17,733	4,895 47	13,052 23
Northumberland	Kennebecas River	116,270	29,081 83	116,270	29,081 83	29,081 83
	Moss Glen	10,200	1,924 47	10,200	1,924 47	1,924 47
	Horse Shoe, Miramichi	208,892	55,058 36	208,892	55,058 36	55,058 36
	Outer Bar	29,935	7,965 31	29,935	7,965 31	7,965 31
Queen's	Grand Dune	37,975	10,121 67	37,975	10,121 67	10,121 67
	Gordon Flats	22,425	4,403 95	22,425	4,403 95	4,403 95
	Grand Lake	93,555	16,372 96	93,555	16,372 96	16,372 96
	McManns Cove	20,440	4,522 82	20,440	4,522 82	4,522 82
Restigouche	Jennings	86,630	16,915 96	600	274 10	17,190 06
	Washadenook	48,975	6,340 85	16,700	1,732 82	8,073 65
	Grimross, Middleborough	12,040	3,274 99	12,040	3,274 99	3,274 99
	Gagetown Creek Canal	33,590	5,968 99	33,590	5,968 99	5,968 99
St. John	Spoon Island	3,000	402 51	3,000	402 51	402 51
	Ward's head, Salmon R.	40,925	5,788 89	5,700	804 70	4,983 59
	Carley's stand	31,025	2,606 05	5,600	863 11	3,369 16
	Chapman & Bates' Canal			29,300	3,114 25	3,414 25
St. John	Upper Gagetown wharf			1,700	1,101 90	1,101 90
	Dalhousie	22,301	6,543 08	22,301	6,543 08	6,543 08
	Traverse	110,840	21,415 93	110,840	21,415 93	21,415 93
	I. C. Railway terminus	159,172	41,553 75	19,215	4,390 78	45,944 53
St. John	Navv Island	2,294	9,296 79	2,294	9,296 79	9,296 79
	Marble Cove	29,925	4,374 40	29,925	4,374 40	4,374 40
	Murray's Mills	23,880	3,441 65	23,880	3,441 65	3,441 65
	Indian town wharf	1,615	192 83	1,615	192 83	192 83
St. John	Long wharf	7,137	2,680 24	7,137	2,680 24	2,680 24
	Miller & Woodman's	9,275	1,090 42	9,275	1,090 42	1,090 42
	Hayford & Stetson	8,015	942 29	8,015	942 29	942 29
	International wharf	450	52 90	450	52 90	52 90
St. John	Adams wharf	7,513	3,247 29	7,513	3,247 29	3,247 29
	Anchor Line wharf	4,695	996 81	4,695	996 81	996 81
	Dominion Atlantic Railway wharf	15,325	4,484 72	15,325	4,484 72	4,484 72
	St. John winter berth	320,548	40,956 91	320,548	40,956 91	40,956 91
St. John	Harbour channel	3,413	5,063 92	3,413	5,063 92	5,063 92
	Purves Macdonald	675	142 57	675	142 57	142 57
	McAvity wharf	2,640	270 98	1,470	335 90	608 88
	Lawton's	570	101 46	570	101 46	101 46
St. John	Thorne	1,980	249 02	1,980	249 02	249 02
	Maritime Natl Co. wharf	1,425	224 52	1,425	224 52	224 52
	Cushing's mill	20,850	1,222 86	20,850	1,222 86	1,222 86
	Hulvard Bros.			1,400	314 10	314 10
			120,586 33	1,400	3,040 78	125,627 11







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STATEMENT of Dredging showing Quantities removed in each Province and Cost of each work for the twenty nine Years ended June 30, 1901.

Fiscal Year.	New Brunswick.			Nova Scotia.			Prince Edward Island.			Total.		
	Quantity c yds.	Cost. \$	c yds.	Quantity c yds.	Cost. \$	c yds.	Quantity c yds.	Cost. \$	c yds.	Quantity c yds.	Expenditure Cubice Yard.	Cost per Cubice Yard.
1872	38,000	13,240 50	23,260		8,422 70				61,320	21,663 20	0 34 328	
1873	57,725	11,395 54	18,000		6,545 61		6,800	2,392 92	85,125	23,334 10	0 28 71	
1874	78,223	17,325 05	24,416		13,238 25				121,294	40,456 75	0 33 354	
1875	79,935	17,040 52	91,974		21,885 90				230,192	49,848 92	0 21 642	
1876	97,690	23,161 90	127,785		34,846 74				290,935	70,706 91	0 23 591	
1877	81,070	23,323 92	106,857		29,607 94				270,787	64,943 04	0 23 983	
1878	132,555	27,400 23	116,307		28,257 59				295,352	64,831 88	0 21 951	
1879	63,540	16,581 79	125,684		31,765 84		760	374 08	228,379	64,396 60	0 28 197	
1880	44,315	12,555 81	87,118		23,061 64		2,317	633 44	180,085	45,439 46	0 25 232	
1881	79,640	18,026 87	89,566		33,363 71				216,531	61,547 15	0 28 331	
1882	48,765	13,422 70	143,616		42,996 93				200,716	67,500 00	0 25 890	
1883	47,048	17,103 58	157,560		49,050 58				284,368	79,509 01	0 25 959	
1884	128,997	24,400 55	76,164		35,254 73		8,125	3,997 59	268,359	62,576 68	0 23 212	
1885	68,505	11,874 63	56,790		21,421 05				142,432	46,706 34	0 33 793	
1886	69,440	11,452 86	53,400		25,621 19				128,977	43,288 79	0 33 56	
1887	59,132	9,232 50	84,175		29,847 60				138,102	45,000 00	0 34 56	
1888	63,635	16,398 08	56,910		32,697 00				144,785	64,798 03	0 27 31	
1889	80,068	20,544 93	59,753		24,821 55				175,253	54,451 87	0 30 71	
1890	96,588	20,573 06	61,638		24,576 68				175,250	53,605 55	0 30 23	
1891	75,025	20,592 85	81,933		24,375 68				188,328	60,757 27	0 32 249	
1892	108,055	23,742 26	81,934		18,125 88				215,454	56,980 67	0 26 44	
1893	77,505	21,964 25	59,781		28,664 57				198,622	62,498 50	0 31 46	
1894	59,715	13,630 11	105,463		32,202 70				243,238	56,261 71	0 26 38	
1895	98,905	21,352 63	36,428		15,878 89				171,693	47,481 45	0 27 60	
1896	203,975	34,050 86	84,756		22,083 46				339,788	65,068 94	0 19 73	
1897	187,325	27,611 17	147,086		31,417 57				381,120	69,810 23	0 18 31	
1898	109,068	23,615 82	155,510		26,628 81				311,608	73,228 34	0 23 59	
1899	175,955	28,232 46	152,635		37,589 32				423,332	83,336 41	0 19 76	
1900	205,569	32,615 29	94,557		36,141 17				325,446	87,740 59	0 26 91	
	2,707,601	578,274 40	2,521,882		794,296 17		18,005	7,458 63	6,477,499	1,689,490 80	0 26 08	



1-2 EDWARD VII., A. 1902

DREDGING MARITIME PROVINCES *Continued.*

STATEMENT of Dredging showing Quantities removed by hand in each Province and Cost of each dredging for the twenty nine Years ending June 30, 1901.

FISCAL YEAR.	NEW BRUNSWICK.			NOVA SCOTIA.			PRINCE EDWARD ISLAND.			Total Quantity.	Total Expenditure Cubic Yard.	
	Quantity		Cost.	Quantity		Cost.	Quantity		Cost.		% cts.	% cts.
	c. yds.	% cts.		c. yds.	% cts.		c. yds.	% cts.				
1878 79				245	555 13					245	555 13	2 26 58
1879 80				12,370	3,686 90					12,370	3,686 90	0 29 64
1880 81				11,140	2,560 25					11,140	2,560 25	0 22 98
1881 82				10,640	2,650 00					10,640	2,650 00	0 24 90
1882 83				8,190	2,500 00					8,190	2,500 00	0 30 52
1883 84				5,460	2,500 00					5,460	2,500 00	0 45 78
1899 1900				343	248 71					343	248 71	0 72 51
1900 01				320	250 75					320	250 75	0 78 35
				48,708	14,931 74					48,708	14,931 74	0 30 65



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STATEMENT of dredging in the Maritime Provinces, showing quantities removed by and expenditure of each Dredge during the twenty-nine Years ended June 30, 1901.

Dredge	Total quantities and cost for twenty-eight Years ending June 30, 1900.				1900-1901.				Total for twenty-nine Years ended June 30, 1901.			
	Total Quantity.		Cost.		Quantity.		Cost.		Total Quantity.		Total cost.	
	c. yds.	¢	cts.	¢	c. yds.	¢	cts.	¢	c. yds.	¢	cts.	¢
St. Lawrence	1,317,514	347,575	08	0 26 38	50,487	16,217	71	0 32 12	1,368,001	363,792	79	0 26 50
Canada	866,314	274,739	63	0 31 58	29,070	7,389	03	0 25 41	895,384	282,128	66	0 31 50
New Brunswick	1,302,080	237,296	18	0 18 22	77,000	11,304	61	0 14 68	1,381,080	248,600	79	0 18 00
Prince Edward	1,169,428	283,699	86	0 23 90	23,220	18,232	96	0 78 52	1,192,648	301,932	82	0 25 31
(Old) Cape Breton	534,938	139,074	33	0 25 99					534,938	139,074	33	0 25 99
Geo. McKenzie	644,560	254,254	74	0 30 44	17,800	13,285	60	0 74 63	662,360	267,540	34	0 42 39
Cape Breton	277,886	47,730	38	0 17 17	83,899	10,803	80	0 12 87	361,785	58,534	18	0 16 17
Clam Shell	26,925	10,812	42	0 40 15	44,470	10,506	88	0 14 04	71,395	21,319	30	0 29 86
	6,139,645	1,595,182	62	0 25 98	325,946	87,740	59	0 26 91	6,465,591	1,682,913	21	0 26 02



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DREDGING MARITIME PROVINCES *Continued.*  
Statement of dredging performed by hand in the Maritime Provinces, showing quantities removed and expenditure at each locality for twenty-nine Years ended June 30, 1901.

Locality	Total quantities and cost for twenty-eight Years ending June 30, 1900.				1900-1901.				Total for twenty-nine Years ended June 30, 1901			
	Total Quantity.	Cost.	Per cubic yard.	Quantity.	Cost.	Per cubic yard.	Total Quantity.	Total cost.	Cost per cubic yard.			
Pictou County, N. S.	c. yds.	£	cts.	c. yds.	£	cts.	c. yds.	£	cts.			
	42,595	12,804 68	0 30 06				42,595	12,804 68	0 30 06			
	5,470	1,627 60	0 29 86				5,470	1,627 60	0 29 86			
	343	248 71	0 72 51	320	250 75	0 78 35	663	499 46	0 75 33			
	48,408	14,680 99	0 30 34	320	250 75	0 78 35	48,708	14,931 74	0 30 65			



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## PROVINCE OF QUEBEC.

## RIVER ST. LAWRENCE SHIP CHANNEL.

(Following is an extract of a report made by Assistant Engineer F. W. Cowie):—

The distance between Montreal and Quebec by the River St. Lawrence ship channel is 160 miles. Of this distance, about 65 per cent is natural deep water, not requiring any improvement.

From Montreal to Three Rivers, 82 miles, the tide is not appreciable.

From Three Rivers to Batiscan, 20 miles, the tide can always be felt, but owing to uncertainty of time and height, it cannot be depended upon for navigation.

From Batiscan to Portneuf, 22 miles, during six hours out of every twelve, half-tide, giving an additional depth of from  $1\frac{1}{2}$  to 4 feet, may be taken advantage of during that six hours.

From Portneuf to Quebec, 36 miles, there is a tide of from 9 to 15 feet, giving tidal navigation for about nine hours out of every twelve.

The water in the river has a very great annual fluctuation. The average height above ordinary low water is for May,  $6\frac{1}{2}$  feet ; June,  $4\frac{1}{2}$  feet ; July,  $3\frac{3}{4}$  feet ; August,  $1\frac{3}{4}$  feet ; September, 1 foot ; October,  $\frac{1}{2}$  foot ; November,  $\frac{3}{4}$  foot.

Unfortunately, however, the low-water season is the season of largest cargoes.

The total fall, in water level, in the river at ordinary low water between Montreal and Quebec, is about 29 feet.

From Montreal to Three Rivers, 11 feet ; from Three Rivers to Batiscan,  $3\frac{1}{2}$  feet ; from Batiscan to Portneuf,  $10\frac{1}{2}$  feet, and from Portneuf to Quebec, 4 feet.

The current varies throughout. It is strongest at St. Mary's current, in Montreal harbour, at Cap à la Roche and at the Richelieu rapids. It is quite gentle in Lake St. Peter.

The general average is about  $2\frac{1}{2}$  miles per hour.

The general direction of the river being northward, the season is shortened by the fact, that the last ice to yield in the spring is nearest the outlet.

Before the commencement of dredging operations, the depth on the flats of Lake St. Peter was about 11 feet at the ordinary low water of autumn of that time.

In the year 1888 the channel from Montreal to Cap à la Roche was completed to  $27\frac{1}{2}$  feet at ordinary low water, and at Cap à la Roche and Cap Charles, where most of the material to be removed was rock, the depth was  $27\frac{1}{2}$  feet at half-tide. From Cap Charles to Quebec it was suspected that there were shoal places, but nothing definite was known.

At that time, the tonnage tax having been found against the interests of trade in the St. Lawrence route, an Act was passed relieving the Montreal Harbour Commissioners of their indebtedness with respect to the River St. Lawrence ship channel, and transferring the work, the plant, &c., to the government ; the channel to be continued and completed as a public work.

The plant then consisted of six elevator dredges, 7 tug-boats, 3 stone-lifters and a number of scows, barges, &c., with a leased shipyard, machine shop and office ; all in very bad repair.

Under the Public Works Department, from 1888 until 1898, the work commenced by the harbour commissioners was continued.

The difficult rock work at Cap à la Roche and Cap Charles was completed, as designed.



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Almost the whole of the dredged portions of the river, except the channel in Lake St. Peter, was cleaned up or deepened, and many curves and narrow places were widened.

Surveys were made, and, between Cap Charles and Quebec, to avoid the necessity of waiting for the tide, channels were dredged through several shoals.

The extraordinary low water of 1895 and 1897, and the increase in size of vessels urgently called for a wider and deeper channel, and for this, new, larger and more powerful dredges and plant were required.

In 1899 the dredging plant was in a position to warrant the commencement of a more extensive plan of operations. Two new elevator dredges of large type, with their tugs and plant, had proved their efficiency. Two powerful steel dredges, designed according to the best practice and experience in this identical work, with their tugs, &c., were almost completed; and two more, to complete the six required, were authorized.

With this dredging fleet, and the necessary repair shops and ship yard at Sorel available, and having in view the faults of the old channel, the type of steamships using it, and the necessity of work capable of immediate utility, the question of type of channel to give the best results was carefully considered.

The old channel depth was  $27\frac{1}{2}$  feet at low water of ordinary years, but as will be seen from the attached table, this depth could not be relied on during occasions of extraordinary low water.

The low water of 1897, the lowest on record, except the short period of extraordinary low water of 1895, has been adopted as the plain of river level at which the improved channel will be made 30 feet in depth.

It was likewise decided to make the channel as wide as could be dredged in one cut.

The object in view, is, therefore, to realize in the shortest possible time, a channel 450 feet wide, and 30 feet deep at the extreme low water level of 1897, from the eastern limit of Montreal harbour to available tide water at Batiscan.

Between Longue Pointe, the eastern limit of Montreal harbour, and tide water at Batiscan, in a distance of about 100 miles, the length of channel requiring improvement is estimated at 50 miles.

At the close of the season of 1900, the length completed was 10.8 miles.

*At the date of writing, the close of the season of 1901, the total length completed to a minimum width of 450 feet is 17.20 miles, or 18.20 miles by including a mile of channel in Lake St. Peter, deepened to 30 feet, but not widened.*

Early in 1903, it is expected that between Sorel anchorage and Montreal harbour, the channel will be completed, marked and opened for navigation day and night.

Early in 1904, before the low water sets in, it is hoped that by taking advantage of the tide up to Batiscan, vessels may safely navigate in a channel of 30 feet, between Quebec and Montreal, at lowest water.

In the improvements being carried on, the channel is not only being widened and deepened, but in many places it is being straightened.

It is, in fact, being designed so that, with good range lights and a few gas buoys, it will permit of easy and safe navigation day and night.

The addition to the work is enormous. Shoals that were formerly avoided by a detour, are cut through or removed.

The extreme low water of 1897, at which level the new channel will give 30 feet, is nearly  $1\frac{1}{2}$  feet lower than the ordinary low water, when there is  $27\frac{1}{2}$  feet in the present ship channel.

The depth of the new channel will, therefore, be almost 4 feet deeper than the present channel.

#### RIVER ST. LAWRENCE SHIP CHANNEL.

The following table gives the averages of the greatest and least depths in the  $27\frac{1}{2}$ -foot channel, during the navigation season, from 1890 to date:—



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Year.	Average depth for each month.							From Sorel gauge. During each year. (May to Nov.)	
	May	June.	July.	Aug.	Sept.	Oct.	Nov.	Highest.	Lowest.
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
1890. ....	35 6	35 3	31 9	30 6	30 9	29 9	30 6	37 0	29 0
1891. ....	34 6	31 3	29 9	29 9	30 0	28 3	28 3	36 9	27 3
1892. ....	31 0	31 9	31 6	30 6	28 9	28 3	28 3	33 6	27 3
1893. ....	36 0	34 3	30 9	29 9	29 6	28 6	28 0	37 6	27 6
1894. ....	34 6	31 9	31 0	29 0	28 3	28 9	29 0	36 0	27 7
1895. ....	33 3	31 3	28 3	28 3	27 6	26 9	26 9	34 6	25 10
1896. ....	33 6	30 6	28 9	28 0	27 6	27 9	29 0	37 0	27 4
1897. ....	35 6	32 6	30 3	29 3	28 0	27 0	27 6	37 0	26 5
1898. ....	31 6	30 9	29 8	28 6	28 2	28 3	28 6	32 1	26 9
1899. ....	36 0	31 9	30 3	28 6	27 6	28 0	27 9	37 9	26 9
1900. ....	33 6	30 9	30 6	29 6	28 1	28 9	29 2	36 9	27 4
1901. ....	34 3	31 10	29 2	28 3	27 7	27 4	27 3	36 3	26 6

The semaphore at St. Jean des Chaillons, was maintained as usual, by the department, to indicate the depth of water in the Cap à la Roche channel.

All of the dredged or doubtful portions of the ship channel, between Longue Pointe, the eastern limit of Montreal harbour and Quebec, were thoroughly tested and examined during the season, as has been done annually since 1898.

No boulders nor obstructions of a dangerous character were found.

During the supervision of the dredging, the testing and the other work, according to special orders from the Hon. the Minister, the officers of the department take every precaution, and if necessary use the government plant for the safety and assistance of navigation.

Throughout the season of 1901, there was not a single grounding or accident that in any way reflected on the ship channel.

In every accident the vessel was outside the channel.

The most serious grounding of the season was that of H.M.S. *Indefatigable*. This accident happened in the ship channel in Quebec harbour. The vessel was on her way to Montreal, and in charge of a Montreal pilot. At the point of grounding the channel is 1,600 feet wide, and in the centre 150 feet deep.

Three accidents took place near St. Antoine, where the natural channel is wide and deep.

The ships of light draught suffered most during the season.

The officers of the department have had constantly in view night navigation, as soon as it can be made practicable and safe.

The improved channel is being constructed with especial reference to safe night navigation, especially for all inward bound vessels.

With permanent range lights to mark the widened tangents and a few lighted buoys at bends and isolated points, night navigation would not be difficult.

The steamers of the Richelieu and Ontario Navigation Company sail with great regularity, always at night. It is not generally known that during the low water season they are obliged to keep to the channel in Lake St. Peter.

Their record is an almost entire freedom from groundings.

The capacity of the dredging plant, already up to 2,500,000 cubic yards in one year, will be enormously added to early in the coming season (1902).

At Sorel the ship yard and shops are already assuming the proportions and completeness of a modern ship building establishment.

The fifth new dredge *Lafontaine* was completed and commissioned for work in August, 1901. Like the *Laurier* and *Lady Aberdeen* she is designed for work in sand



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or soft clay. With the new twin-screw tug *Lac St. Pierre*, and two 300-yard scows it makes a magnificent plant.

The sixth dredge will be ready for work early in the season 1902.

A stone-lifter, barges, tugs and scows are being constructed.

A large steel sea-going-hopper hydraulic dredge is commenced. It is designed for the improvement of the River St. Lawrence ship channel below Quebec, and for work in connection with Atlantic ports.

The new hydraulic dredge *J. Israel Tarte* has been completed and successfully tried at Toronto. Everything possible has been done to provide a dredge that will successfully and most speedily deepen and widen the channel in Lake St. Peter.

Four of the dredges worked for the greater part of the time day and night.

In spite of precautions and constant watchfulness, several serious breakdowns occurred, with consequent delays.

The strain and wear and tear, however, on the heavy machinery, working day and night for 180 days, is enormous. Certain parts of the heavy machinery had to be renewed as often as three times.

Besides weather and repairs, the most general causes for delay were steamships passing, changing anchors and taking coal.

The standard of steady work is, when the dredging machinery is in motion, 75 per cent of the possible working time.

#### DREDGING Operations Completed, 30-foot Channel, to End of Season 1901.

Locality.	Description of work.	Width.	Depth.	Length of Channel Completed. Miles.
Pointe aux Trembles (en haut)	Widening and deepening.	450 to 650	30 ' 0"	1 0
Ile Ste. Therèse		450 ft.	30 ' 0"	0 4
Varennas to Cap St. Michel.		450 to 500	30 ' 0"	3 0
Cap St. Michel to Verchères.	Straightening, widening and deepening			
		450 ft.	30 ' 0"	4 5
Verchères Traverse.		450	30 ' 0"	1 1
Verchères to Contrecoeur.		450	30 ' 0"	1 7
Contrecoeur Channel	Widening and deepening	450	30 ' 0"	1 2
Ile de Grâce Channel.	Straightening, widening and deepening			
		450	30 ' 0"	2 1
Stone Island	Widening and deepening	450	30 ' 0"	1 1
Lake St. Peter	Deepening	325	30 ' 0"	1 0
Three Rivers.	Straightening, widening and deepening	600	30 ' 0"	0 5
				17 6
Chaudière and Pointe Chaudière.	Cleaning up small sand bars.	300	27 6	
La Grande	Completion of new channel.	500	30 ' 0"	0 4
Cap Santé		500	30 ' 0"	0 2
Ste. Croix Bar.	Completion of new channel.	500	30 ' 0"	0 3
				18 5
				Miles.
Total length of dredging completed between Montreal Harbour and Bastican, Dec. 1901				17 6
Estimated length requiring dredging				50 0

NOTE.—The low water level of 1897, is the datum to which the dredging is being done to 30 feet. This level being 1 4 feet lower than the "Ordinary Low Water" when there is 27½ feet in the Ship Channel, the channel being dredged will therefore be nearly 4 feet deeper than the channel now in use.







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PUBLIC WORKS OF CANADA.

RIVER ST. LAWRENCE SHIP CHANNEL.

Abstract of work of Dredging Fleet during the fiscal year ended June 30, 1901.

Dredge	Locality of Dredging.	Time of Service, Days.	Nominal Working Time, 10 hrs per Day, Hours.	Hours Actual Dredging	Number of Scaws filled	Number of Cubic yards Dredged, Scow Measurement	Dredging at low water, Depth, ft.	Width.	Character of Soil.	Remarks.
" Lady Auribon "	Rodeo Grace Channel Cap St. Peter	164	3,020	2,221½	3,673	734,600	30'0"	450 ft.	Soft blue clay.	New steel dredge 1900.
		21	400	246½	603	120,600	30'0"	300 ft.	Soft blue clay.	
		185				855,200				
" No. 11 " Lady Minto "	Cap St. Michel Curve Rodeo Grace Channel	197	1,070	659½	410	61,900	30'0"	450 ft.	Soft clay.	Old dredge broken up Nov. 1900. New steel dredge, commenced July 6th, 1900.
		6	60	19½	17	3,400	30'0"	450 ft.	Blue clay.	
		171	3,085	2,138½	2,454½	468,150	30'0"	450 ft.	Hard blue clay.	
		177				471,550				
" No. 8 " Three Rivers Three Rivers Harbour Rodeo Thoresen Pointe aux Trembles Curve		25	250	186½	137	20,550	30'0"	600 ft.	Clay and stones.	
		19	190	106½	52½	7,875	30'0"		Sand and clay.	
		73	730	477	145½	21,790	30'0"	450 ft.	Clay and stones.	
		46	460	365½	426	63,900	20'0"		Clay, sand and stones.	
		163				114,115				
" Lacombe "	Cap St. Michel to Vercheres	183	3,385	2,213½	3,499	731,760	30'0"	450 ft.	Clay	
" Laval "	Cap St. Michel to Vercheres Champlain Pointe Capronville St. Croix Bar Stone Island Vercheres to Contrecoeur Vercheres Traverse	12	230	139	922½	27,825	30'0"	450 ft.	Hard blue clay.	
		12	120	64	18½	7,250	27'6"	300 ft.	Sand and stones.	
		9	90	67½	44½	6,650	27'6"	300 ft.	Sand	
		18	180	97½	63½	9,550	29'0"	250 ft.	Sand and stones.	
		50	500	332½	233½	35,441	30'0"	450 ft.	Soft clay	
		57	885	655½	752½	112,900	30'0"	450 ft.	Hard clay, sand and stones.	
		7	140	108½	77½	11,750	30'0"	450 ft.	Stuff clay	
		165				211,370				



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RESUME.

"Lady Aberdeen"	185	3,420	2,467	855,200
"No. 11"	107	1,070	659	61,900
"Lady Minto"	177	3,145	2,157	471,550
"No. 8"	163	1,630	1,134	114,115
"Laura"	183	3,385	2,213	731,760
"Laval"	165	2,145	1,444	211,870
				2,445,895







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Real estate	8,000 00	8,700 95	146,342 79	146,342 79	944 06	92,351 91
New buildings	38,075 87					
Rebuilding wharfs	12,368 13					
Tools and machinery	5,143 36					
Dredge J. L. Tait	5 86 72					
Six dredges Nos. 3 and 4	41 75					
Dredge Ladouche	38,974 96					
Dredge No. 6	4,704 48					
S/S. Frontenac	55,530 41					
Tug Chateaufort	794 17					
Tug Lac St. Pierre	15,101 97					
Tug No. 7	19,684 62					
Three dumping scows, 300 c. y.	33,883 73					
Two dumping scows, 75 c. y.	3,628 17					
1 Winch scow	1,267 45					
Coal Barge No. 2	17,335 61					
Coal Barge No. 3	33 16					
Stone Lifter No. 3	2,891 80					
Elec. equipment of ship yard	2,679 49					
Steam Locomotive	1,914 93					
S/S Maurice Tug Aubette	1,989 42					
	255,922 52	30,782 24	50,490 47	16,730 96	10,376 93	29,251 54











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## DREDGING IN THE CHATEAUGUAY RIVER.

Between July 4 and September 19, 1900, dredging operations were carried on below the basin on the Chateauguay river, deepening and widening the channel at the lower or lake entrance. The material removed consisted of 25,330 cubic yards of hard pan, boulders, clay and quick sand.

As the main steamboat channel from the lake to the basin is a very crooked one, a whole season's dredging would be required to straighten it sufficiently to enable the markets boats, when loaded, to pass without striking.

## DREDGING AT COTEAU LANDING.

Dredging was performed at Coteau Landing, under contract, by Messrs. L. Cohen & Sons, which consisted in the continuation of the channel, through the boulder shoal, between the new elevator and the Soulanges canal, but owing to the very hard material encountered, the contractor asked to be released from his contract, which request was granted by this department on August 10, 1900.

The material removed from July 1 to August 10 at this place, was 10,850 cubic yards of boulders, at a cost of 14 cents per cubic yard.

## DREDGING ON THE GATINEAU RIVER.

The construction of the new dredge *Ontario* being completed on July 9, 1900, she commenced dredging operations on the Gatineau river, above the railway bridge, on the 11th, and continued there up to August 1, removing 5,900 cubic yards of sand. The object of this work was to deepen the channel sufficiently to enable free passage to the logs coming down the river.

## DREDGING AT GRAHAM.

From May 11 to June 13, 1901, dredging was performed at this place by dredge No. 4, making an approach and turning basin to and in front of the wharf, to enable passenger and freight steamers to land. The westerly approach was made 500 feet long and 50 feet wide, and the easterly approach, 800 feet long, 50 feet wide, and a turning basin in front of wharf, 150 feet wide and 250 feet long. 14,960 cubic yards of clay and hardpan were removed.

## DREDGING ON THE LIÈVRE RIVER.

On July 3, 1900, dredging operations were in progress on the Lièvre river, and continued the whole season. The object of this work is to deepen the channel, through the various shoals, between the mouth of the river and the village of Masson, to render the various lumber vessels a free outlet from the different docks to the Ottawa river. 42,625 cubic yards of sand and slabs were removed.

This work has proved of great benefit to the lumbering industry on this river, but owing to the immense slab shoals, formed in the basin between the McLaren and Ross docks, which every spring discharges large quantities of mill refuse into the channel, the benefit of the work now being done will very soon be diminished.



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## DREDGING ON THE RICHELIEU RIVER.

Between July 2 and November 18, dredging operations were performed on this river by the dredge *Canals No. 1*, deepening a channel at Pointe à la Mule Flats, and widening and deepening an approach from the main channel to Sabrevois wharf as well as deepening in front of the wharfs at Iberville.

On May 4 dredging was resumed by this dredge at Iberville, and continued up to the close of the fiscal year, leaving a turning basin 110 feet wide, 694 feet long, to a depth of 9 feet at low water.

The total quantity of material removed at Pointe à la Mule Flats, Sabrevois and Iberville was 29,777 cubic yards of sand, clay, gravel and stones.

## DREDGING AT ST. JEAN DES CHAILLONS.

On July 3, 1900, the dredge *Nithsdale* was working at this place, dredging along the front of the wharf, to a depth of 8 feet at low water, to permit the market boats to approach during low tide.

Seven hundred cubic yards of gravel and stone were removed.

## DREDGING AT ST. MICHEL DE BELLECHASSE.

Between July 9 and October 7, the dredge *Nithsdale* worked at this place, dredging through a boulder and clay shoal, about 350 feet from the wharf. A channel was made through this shoal, 400 feet long, 125 feet wide, to a depth of 8 feet at low tide.

On May 20, 1901, this work was resumed by the same dredge, and continued up to June 30, the close of the fiscal year.

The total amount of material removed at this place, was 25,376 cubic yards of hardpan, stones and gravel.

## DREDGING AT ST. NICHOLAS.

From the 1st to the 18th May, 1901, the dredge *Nithsdale* worked at this place; removing a quantity of old crib-work and planking around the wharf.

## DREDGING AT VALLEYFIELD.

From July 2 to November 17, 1900, the close of navigation, dredging was performed at Valleyfield by the dredge *No. 7*. This work consisted of widening an approach to the flumes of the cotton mills, and although the material removed was of a hard nature and the current very strong, making it difficult to take out the loaded scows, satisfactory work was done. About 12,000 cubic yards of boulders and rock being removed.

## DREDGING AT YAMASKA.

On July 2, 1900, dredging operations were in progress on the Yamaska river, the dredge *St. Louis* continuing to work there up to the close of navigation, deepening the channel east of the dam to 6 feet at low water. On April 29, 1901, work was resumed at this place by the same dredge and continued up to the end of the fiscal year. The total quantity of material removed consisted of 26,750 cubic yards of sand, clay and gravel.



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## PROVINCE OF ONTARIO.

## DREDGING AT BELLEVILLE.

Dredging operations were performed by the dredge *Queen* at Belleville, between September 10 and November 11, 1900. This work consisted of the deepening of the channel at the mouth of the Moira river, on the west side of the island; 18,190 cubic yards of gravel and stone were removed.

Considerable dredging is yet required at this place to prevent the yearly overflow of the river at its outlet.

## DREDGING AT BURLINGTON PIER.

Dredging operations were commenced at this place, on July 30, by the dredge *Queen*, and continued up to September 4, 1900, making three cuts, 25 feet wide, at each end of the piers to a depth of 14 feet; 5,070 cubic yards of sand and clay were removed.

Owing to the deep draught of vessels carrying ore to the new smelting works at Hamilton, it was found necessary to place the dredge *Nipissing* at this work, and on October 18 this dredge commenced work, and continued to November 17, the close of navigation. One cut was made, from the lake entrance to the government bridge, a distance of 1,400 feet, 25 feet wide, and to a depth of 16 feet, removing 9,112 cubic yards of hardpan, sand and mud.

On May 13, 1901, the dredge *Nipissing* resumed operations between the piers, and continued up to the close of the fiscal year, removing 18,073 cubic yards of sand and clay. A channel was thus completed, between the piers and at the lake and bay entrances, giving ample room to any vessel at present passing through.

## DREDGING AT COBOURG.

Dredging operations were performed at this place from September 10 to October 27, making a channel through the shoal at the entrance to the piers, 50 feet wide, 500 feet long, to a depth of 14 feet at low water. Two cuts were also made along the west side of the east pier, in front of the freight shed, 100 feet long, 25 feet wide and 14 feet deep at low water. The inner harbour was also deepened along the north and east dock, to permit vessels to unload coal. The total quantity of material removed at this place was 7,065 cubic yards of sand and clay.

## DREDGING AT COLLINGWOOD.

From July 2 to November 17, 1900, the dredge *Challenger* was working at Collingwood, and continued up to the close of navigation, deepening the approach from the main channel to the Meat Co.'s dock. Three cuts were also made along the north side of the wharf, 200 feet long and 13 feet deep. Two cuts were made from the above channel, in a north-westerly direction to Charlton's slab dock, one cut 650 and the other 450 feet long, to a depth of 14 feet at low water. There were also two cuts made at the intersection of the approach to the Meat Co.'s wharf.



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The total quantity of material removed at this place was 38,390 cubic yards of clay, hardpan, rock and sand.

Owing to the rough weather experienced and the shaky condition of the old dump scows, the plant was laid up for the winter on November 17, 1900.

## DREDGING AT HAMILTON.

On July 2, 1900, the dredge *Queen* was working at Hamilton on an approach to the Smelting Works dock, which was completed on the 6th of the same month. A channel was made 280 feet long, 45 feet wide and 14 feet deep, to enable vessels carrying ore to unload at this dock.

Dredging was also performed alongside of Brown's wharf, at this place, where one cut 25 feet wide and 200 feet long to a depth of 14 feet was made. A total of 5,280 cubic yards of sand were removed.

## DREDGING AT HAWKESBURY.

Between September 10 and November 24, 1900, the dredge *Little Giant* worked at this place, deepening and widening the channel from the Ottawa river to Higginson's wharf. One cut was made on the south side of the channel, 1,500 feet long, 25 feet wide, and one cut on the north side, above Cobb island, 1,000 feet long, 25 feet wide, to a depth of  $8\frac{1}{2}$  feet at low water.

On June 1 operations were resumed and continued up to the 29th, the close of the fiscal year.

The total quantity of material removed consisted of 35,012 cubic yards of clay, boulders and hardpan.

## DREDGING IN THE KAMINISTIGUIA RIVER.

Between July 2 and September 30, and from October 25 to November 15, 1900, the dredge *Arthur* was engaged deepening the approaches to the new oil docks and wharfs between the mouth of the Kaministiquia river and the new steel elevator. All to a depth of 20 feet.

On May 21, 1901, dredging operations were resumed at this place, and continued up to June 15.

The total quantity of material removed was 32,762 cubic yards of fine sand and clay.

## DREDGING AT KINCARDINE.

On June 10, 1901, dredging operations were commenced at this place by the dredge *Challenge*, and continued up to the end of the fiscal year, making one cut 1,275 feet long, and one cut 500 feet, to a depth of 15 feet at low water.

The material consisted of 6,570 cubic yards of sand.

## DREDGING AT KINGSTON.

On July 2, 1900, dredging operations were in progress at Kingston, by the dredge *Nipissing*, and continued up to August 15, completing the deepening of the harbour between the Montreal Transportation Company's elevator and Richardson's elevator. 16,986 cubic yards of hardpan were removed.



1-2 EDWARD VII., A. 1902

## DREDGING AT OSHAWA.

On June 28 the dredge *Queen* deepened the channel alongside the dock at this place, 200 feet in length and 14 feet in depth, at low water, to enable freight and passenger vessels to safely unload. The material removed consisted of 1,220 cubic yards of sand.

## DREDGING IN THE OTTAWA RIVER.

Between the 8th and 29th August, 1900, the dredge *Ontario* worked at the Green shoals, on the Ottawa river, where a large quantity of shale rock and boulders were removed from the channel north of the lighthouse.

Nothing more could be done at this place until the thick formation of rock is broken up.

On August 31 work was commenced at Buckingham wharf by the same dredge, and continued up to September 8, 1900. Widening and deepening the turning basin in front of the wharf.

One thousand seven hundred and ten cubic yards of clay were removed.

## DREDGING AT PORT ARTHUR.

On September 1, 1900, the dredge *Arthur* was placed at work in the harbour of Port Arthur, to deepen the channel between the breakwater and the Canadian Pacific Railway dock, to 21 feet at low water, and widen the turning basin around the dock. This work was continued up to October 24.

On June 17 work was resumed at this place, and continued up to the end of the fiscal year.

The material removed consisted of 16,418 cubic yards of sand, clay and hardpan.

## DREDGING AT PORT HOPE.

Between August 17 and October 19, the dredge *Nipissing* worked at Port Hope, making three cuts outside the piers, 300 feet long, 25 feet wide and 14 feet deep at low water, and nine cuts, averaging 425 feet in length, to the same depth inside the harbour.

The material removed consisted of 31,312 cubic yards of sand and mud.

On May 7, 1901, this work was resumed by the dredge *Queen*, and continued up to June 27, when 7,500 cubic yards of sand were removed.

## DREDGING AT PORT STANLEY.

On April 25 the dredge *Ontario* commenced work at Port Stanley, widening and deepening the entrance to the piers, 750 feet long, 100 feet wide and 14 feet deep, and one cut along coal-hoist, 340 feet long. A cutting 65 feet wide and 400 feet long, was also made in line with and west of the lighthouse pier, and one cut 150 feet long in front of the car-ferry landing.

The total quantity of material removed at this place consisted of 21,145 cubic yards of clay, sand and gravel.

It will yet require two months' dredging to complete this work.



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## DREDGING IN THE SOUTH NATION RIVER.

Dredging operations were continued in the South Nation River, from the 3rd July to the 11th November, 1900, deepening the river for drainage purposes. During the above period the channel was deepened a distance of 2,960 feet, 20 feet wide to a depth of three feet. The material dredged being cast over on the banks. Three or four seasons' work are yet required, at this deepening, before the work asked for will be completed.

## DREDGING AT TRENTON.

From July 20 to November 14, 1900, the dredge *Trenton* worked at this place widening what is known as the dark channel, leading from the Murray Canal to the harbour. This work was performed for the purpose of shortening the distance from the Murray canal to Trenton, and now that this channel is used by vessels instead of the circuitous route formerly taken, the channel will no doubt be kept open. The material removed consisted of 70,560 cubic yards of sand, gravel, hard-pan and boulders.



1-2 EDWARD VII., A. 1902

DREDGING - QUEBEC AND ONTARIO.

CLASSIFICATION OF DISBURSEMENTS OF THE DREDGES OPERATED BY DEPARTMENT OF PUBLIC WORKS DURING THE YEAR ENDED JUNE 30, 1901.

DREDGE "CHALLENGE."

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.
Wages..	402 25	420 00	420 00	420 00	251 00	30 00	..	60 00	30 00	140 98	380 17	410 00	2,964 40
Coal..	..	327 75	308 51	249 00	189 72	..	..	..	..	..	25	231 83	1,505 06
Provisions..	..	218 90	113 00	113 00	63 76	..	..	..	..	..	73 98	105 20	687 84
Stores..	..	12 00	2 27	72 60	17 84	..	..	..	..	..	..	24 50	129 21
Equipment.	61 55	..	18 40	..	..	..	..	16 96	..	..	..	..	16 96
Repairs..	..	29 40	..	17 08	..	..	..	5 25	..	..	628 92	42 25	901 50
Towage..	..	..	..	..	49 33	..	..	..	..	..	..	293 17	293 17
Contingence..	..	4 75	..	..	..	..	..	10 70	..	..	40 61	4 25	175 98
Totals..	463 80	1,212 80	852 18	871 68	571 65	30 00	..	92 91	30 00	305 91	1,131 96	1,111 20	6,674 12
Working expenses..	402 25	1,183 40	833 78	854 60	571 65	30 00	..	87 66	30 00	267 29	503 04	1,068 95	5,772 62
Repairs, ordinary...	61 55	29 40	18 40	17 08	..	..	..	5 25	..	98 65	628 92	42 25	901 50
Totals..	463 80	1,212 80	852 18	871 68	571 65	30 00	..	92 91	30 00	365 94	1,131 96	1,111 20	6,674 12



SESSIONAL PAPER No. 19

DREDGING - QUEBEC AND ONTARIO - *Continued.*

CLASSIFICATION OF DISBURSEMENTS of the Dredges operated by Department of Public Works during the Year ended June 30, 1901.

DREDGE "ONTARIO."

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages..	393 29		758 53	395 00	223 83		29 12	85 16	30 00	288 30	404 65	436 46	3,044 47
Coal ..	249 62		298 62	146 56	111 75					48 00	113 25	117 70	1,085 45
Provisions	159 60		114 60	104 40	58 16						107 00	141 16	684 92
Stores ..	171 24		8 30	101 68						70 94	50 02		397 18
Equipment			195 04		58 70			10 00					263 74
Repairs ..	306 51		17 51	206 05	91 30		177 80	4 61		702 88	23 55	105 03	1,635 24
Pilotage ..	20 00		40 00										60 00
Towage..			30 00		442 31								472 31
Contingencies			15 98	41 85	63 20		111 36				20 02	11 44	272 85
Totals ..	1,300 36		1,473 58	995 48	1,049 25		318 28	99 77	30 00	1,110 12	727 55	811 79	7,916 18
Working expenses.	993 85		1,476 07	789 43	957 95		140 48	95 16	30 00	107 24	704 00	706 76	6,280 94
Repairs, ordinary	306 51		17 51	206 05	91 30		177 80	4 61		63 88	23 55	105 03	996 24
Repairs, extraordinary.													639 00
Totals ..	1,300 36		1,473 58	995 48	1,049 25		318 28	99 77	30 00	1,110 12	727 55	811 79	7,916 18



1-2 EDWARD VII., A. 1902

DREDGING—QUEBEC AND ONTARIO—Continued.

CLASSIFICATION OF DISBURSEMENTS of the Dredges operated by the Public Works Department during the Year ended June 30 1901.

DREDGE "NIPISSING."

Items.	July.		August.		September.		(October.		November.		December.		January.		February.		March.		April.		May.		June.		Grand Totals.
	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	
Wages.	395	00			395	00	395	00	690	46	390	00			60	00	30	00	333	43					2,328 89
Coal.	198	20			528	76			105	44									437	00					1,269 40
Provisions	206	00			103	00			190	71															499 71
Stores	22	05				05		92	49	29	42								45	79					121 80
Equipment															135	00									135 00
Repairs.	167	35			8	58		103	36	18	46								199	30					497 05
Contingencies.	21	66						22	23	69	44								46	49					159 82
Totals.	1,010	26			1,037	39		543	08	1,103	93	390	00		195	00	30	00	1,062	01					5,011 67
Working expenses.	842	91			1,028	81		439	72	1,085	17	390	00		195	00	30	00	862	71					4,511 62
Repairs, ordinary	167	35			8	58		103	36	18	46								199	30					497 05
Totals.	1,010	26			1,037	39		543	08	1,103	93	390	00		195	00	30	00	1,062	01					5,011 67



SESSIONAL PAPER No. 19

DREDGING QUEBEC AND ONTARIO (Continued)  
CLASSIFICATION OF DISBURSEMENTS of the Dredges operated by the Public Works Department during the Year ended June 30, 1901.  
DREDGE "QUEEN."

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
Wages.	385 00	385 00	385 00	385 00	331 12	331 12	331 12	331 12	330 00	292 34	338 75	385 00	3,997 51
Coal.	561 40	561 40	95 23	213 50	370 55	370 55	370 55	370 55	370 55	370 55	370 55	370 55	5,043 71
Provisions.	103 00	103 00	103 00	48 44	161 16	161 16	161 16	161 16	100 45	117 00	100 45	117 00	1,284 59
Stores.	35 13	35 13	7 16	48 44	6 45	6 45	6 45	6 45	19 79	19 79	10 52	19 79	157 39
Equipment.				43 05	65 63	65 63	65 63	65 63		119 51	162 51	43 49	600 00
Repairs.		175 02	21 20					3 4			52 75		933 29
Towages.		40 80	11 75		27 70					26 40	3 71		122 75
Contingencies.													110 45
Totals.	385 00	1,300 55	623 34	689 99	822 75	822 75	822 75	822 75	330 00	430 84	1,018 67	545 49	5,985 89
Working expenses.	385 00	1,125 35	602 14	646 94	797 10	797 10	797 10	797 10	330 00	417 35	556 16	502 00	5,052 00
Repairs, ordinary.		175 02	21 20	43 05	65 63	65 63	65 63	65 63		119 51	402 51	43 49	933 29
Totals.	385 00	1,300 35	623 34	689 99	822 75	822 75	822 75	822 75	330 00	430 84	1,018 67	545 49	5,985 29



1-2 EDWARD VII., A. 1902

DREDGING—QUEBEC AND ONTARIO—Continued.  
 Classification of Disbursements of Dredges operated by the Public Works Department, &c.—Continued.

DREDGE "No. 7."

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Wages.	402 26	438 55	445 00	449 91	277 59	379 61	296 04	172 75	38 25	144 13			2,044 09
Coal.		350 20	166 20	118 97	122 24			5 11					802 72
Provisions.		336 50	165 00	167 50	34 50								703 50
Stores.		39 15		11 13									50 28
Equipment.			32 90										32 90
Repairs.		94 06	81 39	104 82				2 90					283 17
Contingencies.		43 89		11 70	36 40								91 99
Totals.	402 26	1,302 35	800 49	904 03	470 73	379 61	296 04	180 76	38 25	144 13			5,008 65
Working expenses.	402 26	1,208 20	809 10	799 21	470 73	379 61	296 04	177 86	38 25	144 13			4,725 48
Repairs, ordinary.		94 06	81 39	104 82				2 90					283 17
Totals.	402 26	1,302 35	800 49	904 03	470 73	379 61	296 04	180 76	38 25	144 13			5,008 65



SESSIONAL PAPER No. 19

DREDGING QUEBEC AND ONTARIO--Continued.  
(CLASSIFICATION OF DISBURSEMENTS OF Dredges operated by the Public Works Department, &c.--Continued.)  
DREDGE "ST. LOUIS."

Items.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Grand Totals.	
	\$.	cts.	\$.	cts.	\$.	cts.	\$.	cts.	\$.	cts.	\$.	cts.	\$.	cts.	\$.	cts.	\$.	cts.	\$.	cts.	\$.	cts.	\$.	cts.	\$.	cts.
Wages	350 00		350 00		350 00		354 04		246 42										211 79		350 00		350 00		2,562 25	
Provisions.	103 00		103 00		103 00		109 80		40 50												103 00		103 00		665 30	
Stores.							5 00		2 45																7 45	
Equipment							56 10																		62 10	
Repairs.	8 80				11 00														62 00		50 75				132 64	
Contingencies	0 75						1 45		6 00													0 76			11 90	
Totals	462 55		453 00		464 00		529 39		295 37						6 00				273 88		503 75		453 70		3,441 64	
Working expenses.	453 75		453 00		453 00		529 39		295 37						6 00				211 79		453 00		453 70		3,309 00	
Repairs, ordinary	8 80				11 00														62 00		50 75				132 64	
Totals	462 55		453 00		464 00		529 39		295 37						6 00				273 88		503 75		453 70		3,441 64	



1-2 EDWARD VII., A. 1902

DREDGING QUEBEC AND ONTARIO - Continued  
CLASSIFICATION OF DISBURSEMENTS of Dredges operated by the Public Works Department during the Year ended June 30, 1901.  
DREDGE CANALS "No. 1."

Items.	July.		August.		September.		October.		November.		December.		January.		February.		March.		April.		May.		June.		Grand Totals.
	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	£	cts.	
Wages.	300 00		300 00		390 00		300 00		205 35		30 00		30 00		30 00		47 37		258 87		466 77		510 00		3,137 26
Coal.													30 00						15 25		248 26				223 51
Provisions.	102 00		101 00		101 25		101 05				56 06								100 00		100 00		100 00		661 96
Stores.	4 25								4 25												40 92				48 70
Equipment.	7 14								1 50																14 64
Repairs.	17 60								20 30										272 21		120 37		63 31		188 24
Contingencies.			4 50				13 65												18 39		7 50		5 02		64 80
Totals.	521 08		491 00		495 75		504 68		240 47		30 00		86 06		36 00		47 37		555 55		953 12		678 33		4,040 31
Working expenses.	503 39		491 00		495 75		491 05		240 47		30 00		86 06		36 00		47 37		252 01		832 75		615 02		4,151 47
Repairs, ordinary.	17 60						13 63												273 54		120 37		63 31		488 84
Totals.	521 08		491 00		495 75		504 68		240 47		30 00		86 06		36 00		47 37		555 55		953 12		678 33		4,040 31
DREDGE "NOTHESDALE."																									
Wages.	365 00		365 00		364 26		350 00		205 29								60 10		186 15		375 00		375 00		2,722 23
Provisions.	144 85		143 00		140 00				178 51												111 70		113 00		741 06
Stores.					5 53		7 05																		12 58
Repairs.					30 10				62 38										200 75		41 08				343 31
Contingencies & rent.	75 26				3,735 67		3 00		1,423 00												3 00				5,240 03
Totals.	585 21		478 00		4,245 56		365 07		1,932 18								60 10		385 90		530 78		488 00		9,059 80
Working expenses.	567 21		478 00		4,215 46		365 07		1,860 80								60 10		186 15		480 70		488 00		8,716 40
Repairs, ordinary.					30 10				62 38										200 75		41 08				343 31
Totals.	567 21		478 00		4,245 56		365 07		1,932 18								60 10		385 90		530 78		488 00		9,059 80



SESSIONAL PAPER No. 19

DREDGING QUEBEC AND ONTARIO Continued.  
CLASSIFICATION OF DISBURSEMENTS OF Dredges operated by the Public Works Department during the Year ended June 30, 1901.  
DREDGE "LITTLE GIANT"

Items	July	August	September	October	November	December	January	February	March	April	May	June	Grand Totals
Wages	x	x	x	x	x	x	x	x	x	x	x	x	x
Towage				40 00	96 00								200 00
Contingencies				1,220 00	3,412 00	384 00							5,016 00
Totals				1,260 00	3,508 00	384 00							5,052 00
Working expenses				1,260 00	3,508 00	384 00							5,152 00
DREDGE "T. P. M. No. 1"													
Wages		65 00	81 00	156 00	330 00							93 00	425 00
Towage		1,836 00	1,972 00	3,448 00	754 00	62 00							6,232 00
Contingencies		1,901 00	2,053 00	3,644 00	814 00	65 00							10,470 00
Totals				3,644 00	814 00	65 00							11,501 90
Working expenses		1,901 00	2,053 00	3,644 00	814 00	65 00							11,501 90



1-2 EDWARD VII., A. 1902

DREDGING—QUEBEC AND ONTARIO—Continued.

Classification of Disbursements of Dredges operated by the Public Works Department during the Year ended June 30, 1901.

DREDGE "No. 4"

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.	% cts.
Wages.		58 50	33 75									110 00	202 25
Towage.				384 00									384 00
Contingencies.		1,744 00	3,032 00									2,904 00	7,680 00
Totals.		1,802 50	3,065 75	384 00								3,014 00	8,226 25
Working expenses.		1,802 50	3,065 75	384 00								3,014 00	8,226 25

DREDGE "ARTHUR"

Wages.			83 30	78 00	136 00								297 30
Towage.							168 00						168 00
Contingencies and Rent.			3,300 00	1,712 00	3,198 00							2,820 00	11,030 00
Totals.			3,383 30	1,790 00	3,334 00		168 00					2,820 00	11,495 30
Working expenses.			3,383 30	1,790 00	3,334 00		168 00					2,820 00	11,495 30



BREEDING QUEEN AND ONTARIO (continued).

CLASSIFICATION OF DISBURSEMENTS OF THE PLEDGES OPERATED BY THE PUBLIC WORKS DEPARTMENT DURING THE YEAR ENDED JUNE 30, 1901.  
DREDGE "TRENTON."

Items.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals
	%	%	%	%	%	%	%	%	%	%	%	%	
	cts	cts	cts	cts	cts	cts	cts	cts	cts	cts	cts	cts	cts
Wages			88 50	75 00	144 00							150 00	457 50
Contingencies & rent.			2,360 00	2,000 00	3,840 00							3,872 00	12,072 00
Totals.			2,448 50	2,075 00	3,984 00							4,022 00	12,529 50
Working expenses			2,448 50	2,075 00	3,984 00							4,022 00	12,529 50
Totals.			2,448 50	2,075 00	3,984 00							4,022 00	12,529 50















SESSIONAL PAPER No. 19

DREDGING ONTARIO AND QUEBEC—Continued.  
Classification and Quantities of Material removed by Dredges operated by the Public Works Department during the Year ended June 30, 1901.  
DREDGE "No. 4."

Description of Material dredged.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	Grand Totals.
	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	c. yds.	
Hard pan.	800		2,600								320	1,110	4,830
Boulders	1,315	130	1,105										2,550
Clay.	1,285	6,015									5,650	7,880	23,830
Sand—ordinary	1,000	8,600											9,600
Totals.	7,400	14,745	3,705								5,970	8,990	40,810

DREDGE "ARTHUR."

Hard pan.			428	3,179									3,607
Clay.	1,450	3,342	3,422	3,842							2,515	5,417	19,988
Clay and stone			392										392
Sand—ordinary		750	600										1,350
Sand—very fine.	3,206	3,766	516	1,632	6,966						2,150	5,587	23,843
Totals.	4,656	7,858	5,558	8,673	6,966						4,665	11,004	49,180

DREDGE "TRENTON."

Hard pan.	140	9,060	10,500	1,510									21,510
Boulders.		2,820	2,920	3,480	7,250						1,970	2,450	20,890
Gravel.	1,000	2,310		2,000							5,480	5,720	16,510
Sand—ordinary				7,110									7,110
Mud.											2,540	2,000	4,540
Totals.	1,440	14,190	13,420	14,100	7,250						9,990	10,170	70,560



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DREDGE STATEMENT.

SHOWING material removed, at different localities, total expenditure on each Dredge and average cost per cubic yard.

Dredge.	Location.	Yards removed.	Character of Soil.	Expendi- ture.	Cost per yard.
Challenge.....	Collingwood.....	38,390	Hardpan and clay.	\$    cts.	cts.
" .....	Kincardine.....	6,570	Sand.....	6,674 12	14 1/2
Ontario.....	Cobourg.....	7,065	Sand and clay.....	7,916 18	22 1/2
" .....	Port Stanley.....	21,145	Sand, clay and gravel...		
" .....	Gatineau—Green Shoals	5,900	Sand.....		
" .....	Buckingham Wharf.....	1,710	Clay .....		
Nipissing.....	Kingston .....	16,986	Hardpan and sand.....	5,011 67	6 1/2
" .....	Port Hope.....	31,312	Sand.....		
" .....	Burlington Piers.....	27,185	Sand and clay.....		
Queen...	Hamilton.....	5,280	Clay and sand.....	5,985 89	15 1/2
" .....	Burlington.....	5,070	Sand, clay and gravel..		
" .....	Belleville .....	18,190	Gravel.....		
" .....	Port Hope .....	7,500	Sand.....		
" .....	Oshawa.....	1,220	" .....		
St. Louis.....	Yamaska .....	26,750	Sand, clay and boulders.....	3,441 64	12 3/4
Canals No. 1. ....	Richelieu River.....	22,472	Clay and boulders. ....	4,640 31	15 1/2
" .....	Iberville.....	7,305	Hardpan and boulders. ....		
Arthur.....	Fort William....	21,300	Clay, sand, hardpan.	11,495 30	23 1/2
" .....	Port Arthur....	16,418	" .....		
" .....	Kaministiquia.	11,462	" .....		
Nithsdale.....	St. Jean des Chaillons...	700	Stones.....	9,059 80	34 1/2
" .....	St. Michel de Bellechasse.	25,376	Hardpan, stones, gravel. ....		
" .....	St. Nicholas.....	.....	Working at wharf .....		
T. F. M. No. 1..	Lièvre River.....	42,625	Hardpan, clay, boulders, slab	11,301 90	26 1/2
Little Giant ..	Hawkesbury ..	35,012	Hardpan, clay, boulders, sand	7,550 25	21 1/2
No. 7... ..	Valleyfield ..	11,955	Shale rock.....	5,008 65	41 1/2
No. 4 .....	Châteauguay ..	25,850	Hardpan, clay, boulders, sand	8,266 25	20 1/2
" .....	Graham's Wharf.	14,960	Clay and hardpan.....		
Trenton. ....	Trenton. ....	70,560	Gravel, sand, h'pan, boulders	12,529 50	17 1/2



## DREDGING MANITOBA.

## RED RIVER.

During the season 1900, the usual work of deepening and straightening the east steamboat channel at the mouth of the Red river was proceeded with, as well as some dredging in West Slough, Selkirk, and subsequently the work of cutting the new channel at the mouth of the Red river, in order to ensure a direct channel and enable navigators to run in and out of the river at all times, that is to say, night and day.

The work of excavating was at once proceeded with until the close of the season 1900, and a total of 9,133 cubic yards were moved from this latter source.

This season, 1901, the dredging plant started work at an early date. A little dredging and removing of snags was done opposite the government dock at Selkirk before running the plant down to the mouth of the Red river. The importance of doing this latter work was manifest, as just along this shore the parties interested in navigation built wharfs, drove piles, sunk small cribs, &c., and all one after another were carried away by either the spring freshets or ice shoves, so that to ensure the safety of the vessels using this wharf, it became necessary to remove the debris hereabove alluded to. Then the plant was towed down to the mouth of the Red river early in May. The old channel was buoyed out, sounded, &c., and it was found that some dredging had to be done to ensure safe navigation of this channel this season; if the frost had been out of the ground from the bed of the proposed new channel earlier, it might have curtailed the above work to some extent. However, the dredging work of the new channel was resumed June 7, and continued on until the latter week of the month, which was the cause of a good deal of delay and inconvenience in working, as well as of several breakdowns, &c., but fair progress was made.

The average cost per cubic yard is .244 cents, which is not so very high, considering that all expenditure on new machinery, &c., are included in the computations, as being part of the working expenses. If both the ordinary and extraordinary repairs were excluded from the computations, the actual cost for working expense would be reduced to .154 cents per cubic yard.

## RED AND ASSINIBOINE RIVERS.

The work of removing snags and boulders from both the Red and Assiniboine rivers about Winnipeg was proceeded with during the year. The expenditure incurred was \$369. This work was also appreciated, but a good deal of it remains to be done along these rivers, particularly about St. Andrew's, St. Agathe rapids, &c., so as to render the rivers navigable at those points.



DREDGING BRITISH COLUMBIA.

The working expenses of the snag boat *Samson* for the months of January, February, March and April were charged to Fraser river, she being engaged during that time almost exclusively in work connected with the mattressing and protection works. The other expenditure was incurred in her usual occupation of removing snags and keeping the river clear between its mouth and Chilliwack, including the North Arm and Pitt river, in sounding and surveying the channel between New Westminster and the sand heads, replacing buoys in main channel and buoying Canoe pass, and the various duties appertaining to this service.

Almost the entire amount of the appropriation was expended on the dredge *Mud Lark*, her tender the tug *Princess*, and two hopper scows. This dredge has now been in constant use for the past eleven or twelve years on the hardest kind of work, and is beginning to show the effects of the severe strain. Consequently, repairs are necessarily becoming more frequent and expensive.

The snag boat *Samson* is also showing the effects of long and arduous service, and, in common with the rest of the government plant, it becomes a question of economy to consider when these frequent and expensive repairs should cease in favour of an entire renewal, which should be anticipated before the present plant becomes entirely useless.

NEW DREDGING PLANT.

A contract for the construction of a 20-foot hydraulic dredge, with a capacity of not less than 500 cubic yards per hour, for use on the Fraser river and such other points in British Columbia where such a machine could be worked advantageously, was concluded by the department at Ottawa some time in August, 1900, with the Polson Iron Works, of Toronto. The dredge is not yet ready for work.

DREDGING PLANT.

The following is a summary description of the dredging plant owned and operated by the Public Works Department in the various parts of the Dominion.

MARITIME PROVINCES.

The self-propelling elevator dredge "St. Lawrence" (iron hull)—

Length over all.....	175 feet.
Beam.....	30 "
Draft when loaded, aft.....	13 5 "
"    "    forward.....	8 5 "
Least working depth, (ladder with 32 buckets dropped 30 feet from bow.....	8 5 "
Greatest working depth, bucket ladder dropped 40 feet from bow.....	28 0 "
Capacity of hopper for spoil material.....	350 cubic yards.
Speed when light.....	6 to 7 miles per hour.
Speed when loaded.....	3 to 4 "
Daily rate of dredging in hard material.....	350 to 700 cubic yds
"    "    ordinary earth.....	750 to 1,000 "
"    "    soft material.....	1,050 to 1,400 "



## SESSIONAL PAPER No. 19

The self-propelling elevator dredge "Canada" (iron hull).

Length over all.....	130 feet.
Beam.....	20 "
Draft when loaded, aft.....	11.5 "
" " forward.....	7.0 "
Least working depth.....	7.0 "
Greatest working depth (ladder 24 buckets).....	16.0 "
Capacity of hopper for spoil material.....	90 cubic yards.
Speed when light and newly painted.....	6 to 7 miles per hour
Speed when loaded.....	3 to 4 "
Daily rate of dredging in hard bottom.....	180 to 270 cubic yards.
" " with ordinary digging.....	180 to 360 "
" " in soft material.....	360 to 450 "

The spoon dredge "New Dominion" (wooden hull)

Length over all.....	90 feet.
Width.....	28 "
Draft.....	5½ "
Greatest working depth.....	21 "
Daily rate of dredging in hard material.....	300 cubic yards.
" " with ordinary material.....	450 "
" " in soft material.....	600 to 700 "
Number of dump scows or barges used.....	4 "

The spoon dredge "Prince Edward" (wooden hull)

Length over all.....	80 feet.
Width.....	28 "
Draft.....	6 "
Greatest working depth.....	21 "
Daily rate of dredging in hard material.....	300 cubic yards.
" " with ordinary material.....	500 "
" " in soft material.....	600 to 700 "
Number of dump scows or barges used.....	3 "

The spoon or dipper dredge "George McKenzie" (wooden hull)—

Length.....	90 feet.
Width.....	28 "
Draft.....	5 "
Greatest working depth.....	22 "
Daily rate of dredging in hard material.....	350 cubic yards.
" " ordinary material.....	500 "
" " soft material.....	600 "

The boom and dipper dredge "Cape Breton" (steel hull)—

Length.....	91 feet.
Beam.....	36 "
Draft.....	7 "
Greatest working depth.....	34 "
Daily rate of dredging in hard material.....	1,000 cubic yards.
" " ordinary material.....	1,500 "
" " soft material.....	2,000 "
Number of barges used (each of 210 cubic yards capacity).....	2 "

N. B. Tug service performed by hired tugs in the Maritime Provinces.

The Clam Shell dredge (wood) "Clam Shell".

With 3 decked scows.

One pile driver, engine and boiler fitted on scow.

One stone lifter, engine and large grips.

One (old) small scow for coal belonging to "New Dominion" at St. John, unfit for use.

Two old side hopper scows at Pictou unfit for use, belonging to dredge "Prince Edward".

One old side hopper scow at Pictou, belonging to dredge "George McKenzie" unfit for use.

One steam launch "Cricket".

## SHIP CHANNEL, RIVER ST. LAWRENCE, BETWEEN QUEBEC AND MONTREAL.

The elevator dredge "Laurier" (Wooden hull)—

Length over all.....	168.0 feet.
Width of beam.....	32.0 "
Depth of hold.....	14.0 "
Average draught.....	10.5 "
Greatest working depth.....	42.5 "
Daily rate of dredging in hard clay, about.....	1,700 cubic yards.
" " ordinary earth, about.....	3,000 "
" " soft clay (Lake St. Peter).....	4,000 "



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The elevator dredge "Laval" (wooden hull, small bucket) —

Length over all	150.0 feet.
Width of beam	30.0 "
Depth of hold	14.0 "
Average draught	11.0 "
Greatest working depth	43.5 "
Daily rate of dredging in hard material	400 cubic yards.
" " " ordinary clay	2,000 "

The elevator dredges "Nos. 11" and "12" (wooden hulls) —

Length over all	137.0 feet
Width of beam	29.5 "
Depth of hold	11.0 "
Average draught	8.5 "
Greatest working depth	38.0 "
Daily rate of dredging in hard material, about	200 cubic yards.
" " " ordinary clay	2,000 "

The elevator dredge "No. 8" (wooden hull) —

Length over all	137.0 feet
Width of beam	29.6 "
Depth of hold	11.0 "
Average draught	8.6 "
Greatest working depth (short bucket frame)	27.0 "
Daily rate of dredging in hard material, about	200 cubic yards.
" " " soft clay, about	1,800 "
" " " ordinary clay, about	1,200 "

Elevator dredge "No. 4." —

Length over all	77 feet 3 inches.
Beam	27 feet 0 inches.
Depth	6 feet 6 inches.
Built	1872
Engine	Horizontal non-condensing.
Cylinder } Diam.	14 inches.
} Stroke	16 inches.
Steam pressure	85 lbs.
Capacity of bucket	2½ cubic yards.
Depth to which dredge can work	50 feet

Rebuilt and altered in 1890.

Elevator dredge "No 7." —

Length over all	77 feet 3 inches.
Beam	27 feet 0 inches.
Depth	7 feet 0 inches.
Built	1874
Engine	Horizontal non-condensing.
Cylinder } Diam.	14 "
} Stroke	16 "
Steam pressure	85 lbs.
Capacity of bucket	1½ cubic yards.
Depth of which dredge can work	32 feet

Rebuilt in 1889

The stone lifter "No 2" (wooden hull) —

Length over all	80.0 feet.
Breadth	25.0 "
Depth of hold	7.9 "
Size of well	22 by 10.0 "

Fourteen dumping scows, the dimensions and capacities of which are as follows :—

No.	Length.	Breadth.	Depth of Hold.	Capacity.
1	60 feet.	16 feet.	6 feet.	60 cubic yards.
2	80 "	16 "	7 "	70 "
3	84 "	20 "	7 "	150 "
4	90 "	18 "	7 "	176 "
5	92 "	23 "	7 "	200 "



## SESSIONAL PAPER No. 19

The coal barge "Caroline"	
Length over all .....	103.7 feet.
Breadth .....	22.5 "
Depth of hold .....	8.3 "
Capacity .....	250 tons.

The coal barge "Waverly"—	
Length over all .....	100.0 feet.
Breadth .....	20.9 "
Depth of hold .....	7.1 "
Capacity .....	250 tons.

The coal scow "No. 1"	
Length over all .....	80.0 feet.
Breadth .....	16.0 "
Depth of hold .....	4.5 "
Capacity .....	90 tons.

The coal scow "No. 2"—	
Length over all .....	54.0 feet.
Breadth .....	18.0 "
Depth of hold .....	4.0 "
Capacity .....	60 tons.

The sounding scow—	
Length over all .....	60.0 feet.
Breadth .....	25.0 "
Depth of hold .....	4.5 "

The winch scow "No. 1"—	
Length over all .....	54.0 feet.
Breadth .....	18.0 "
Depth of hold .....	4.0 "

The winch scows "No. 2"	
Length over all .....	50.0 feet.
Breadth .....	14.0 "
Depth of hold .....	4.0 "

The new shaped canal plant was attended in 1900 by the tugs "John Pratt," "St. James," "St. Francis," "C. J. Bradley," "M. J. Parsons," "Carter," "St. Edward," "Hawthorn," and "Euchaia."

The spoon dredge "St. Louis" (wooden hull)—	
Length .....	50.0 feet.
Width .....	14.0 "
Depth of hold .....	4.0 "
Draft .....	2.5 "
Greatest working depth .....	12.0 "
Daily rate of dredging in hard-pan, etc .....	50 cubic yards.

The plant attended by "Delisle" with two dump scows, each of 80 cubic yards capacity, used only for light digging.

A new scow built in 1900 by	
Length of each wooden hull .....	42.0 feet.
Width .....	8.5 "
Depth of hold .....	3.0 "
Draft .....	1.0 "
Distance between hulls .....	7.0 "

One wooden scow for reserve and supply for Q. & O. dredging fleet.	
Length .....	50.0 feet.
Breadth .....	17.0 "
Depth of hold .....	8.3 "
Draft when loaded .....	6.0 "
Capacity .....	100 tons.

## QUANTITY OF DREDGING

The elevator dredge No. 9 (wooden hull)—	
Length .....	117.0 feet.
Width .....	20.0 "
Depth of hold .....	11.0 "
Draft .....	9.0 "
Greatest working depth .....	18.0 "
Daily rate of dredging in hard material .....	200 cubic yards.
" " " " in soft " .....	2,000 "

Dredge attended by tug "Delisle" with two dump scows, each of 80 cubic yards capacity.



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The dipper dredge "Queen" (wooden hull)—

Length.....	65.3 feet.
Width.....	25.0 "
Depth of hold.....	5.0 "
Draft.....	3.0 "
Greatest working depth.....	16.0 "
Daily rate of dredging in hard material.....	200 cubic yards.
"      "      in medium firm material.....	400 "
"      "      in soft material.....	600 "

Dredge attended by tug "Ottawa" with two dump scows, of 60 cubic yards capacity.

The dipper dredge "Nippissing" (wooden hull)—

Length.....	70.7 feet.
Width.....	25.0 "
Depth of hold.....	6.0 "
Draft.....	4.5 "
Greatest working depth.....	20.0 "
Daily rate of dredging in hard-pan, etc.....	300 cubic yards.
"      "      in stiff clay.....	500 "
"      "      in soft clay and sand.....	800 "

Dredge attended by tug "St. Paul" and two dump scows, of 75 cubic yards capacity.

The dipper dredge "Ontario" (wooden hull)—

Length.....	75.0 feet.
Width.....	25.0 "
Depth of hold.....	7.0 "
Draft.....	4.5 "
Greatest working depth.....	22.0 "
Daily rate of dredging in hard material.....	300 cubic yards.
"      "      in medium firm material.....	500 "
"      "      in soft clay and loose sand.....	800 "

Dredge attended by tug "Sir John" with two dump scows, of 100 cubic yards capacity.

The dipper dredge "Challenge" (wooden hull)—

Length.....	70.5 feet.
Width.....	25.0 "
Depth of hold.....	6.0 "
Draft.....	4.5 "
Greatest working depth.....	21.0 "
Daily rate of dredging in hard material.....	300 cubic yards.
"      "      in medium firm or ordinary earth.....	500 "
"      "      in soft clay and loose sand.....	800 "

Dredge attended by tug "Trudeau" with two dump scows, having a capacity of 60 cubic yards.

MANITOBA.

The dipper dredge "Winnipeg" (wooden hull)

Length.....	71.0 feet.
Width.....	25.0 "
Depth of hold.....	6.0 "
Draft.....	4.5 "
Greatest working depth.....	20.0 "
Daily rate of dredging in hard material.....	300 cubic yards.
"      "      ordinary earth.....	500 "
"      "      soft clay and loose sand.....	800 "

Dredge attended by tug "Sir Hector" with two dump scows, having a capacity of 60 cubic yards, and a coal barge.

The "Priestman" dredge.  
The steamer "Victoria".

BRITISH COLUMBIA.

The dipper dredge "Mud Lark" (wooden hull)—

Length.....	90.0 feet.
Width.....	30.0 "
Depth of hold.....	7.9 "
Draft.....	4.6 "
Greatest working depth.....	40.0 "
Daily rate of dredging in hard-pan and gravel and boulders.....	300 to 400 cubic yds.
"      "      medium hard earth.....	500 to 600 "
"      "      soft material, mud, etc.....	800 "

Dredge "Mud Lark" attended by tug "Princess" and three dump scows.



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The self-propelling stern-wheel, clam-shell dredge "Muskrat"	
Length .....	60.0 feet.
Width .....	30.0 "
Depth of hold .....	3.3 "
Drift .....	1.5 "
Daily rate of dredging m. s. gravel, etc., the only kind of material which has been worked so far	500 cubic yards

The "Muskrat" works with two scows in attendance.

The snag-boat "Samson" and one scow.

The snagging scow built for use on the Fraser while the "Samson" was operating on the Stikine.



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## GRAVING DOCKS.

The Dominion government owns and maintains three graving docks, viz. :—The Lorne Graving Dock, at Lévis, in the province of Quebec ; the Kingston Graving Dock, at Kingston, in the province of Ontario ; and the Esquimalt Graving Dock, at Esquimalt, near the city of Victoria in British Columbia.

## LÉVIS GRAVING DOCK EXTENSION.

In 1899, the necessity for enlarging the Lévis dry dock, was taken into serious consideration. The constantly increasing trade through the St. Lawrence route, the large increase in the number and size of vessels, rendered it imperative that adequate facilities be given for the repairs of the larger class of vessels visiting our St. Lawrence ports.

The question of building a new dock was considered, but as this would take considerable time, it was thought advisable to build at once an additional length to the Lévis dry dock, which could be done in one season and be ready for use without delay.

The original total length of the dock was 484 feet from the inside face of the caisson to the apex of the circular head ; its width at the entrance 62 feet. As the large steamers now being built, nearly 600 feet in length or over, have a greater beam than 62 feet, it may be seen that the dock entrance width governed the maximum length to be given to the dock. For this reason it was deemed sufficient to give to the dock an additional length of 116 feet or a total length of 600 feet.

Plans and specifications were prepared with the object in view that the dockage of vessels should not be stopped during the progress of the work. This was covered by special clauses in the contract and specifications.

Tenders were asked for early in 1899, and the contract awarded October 23, 1899, to Mr. Thomas Powers, of Lévis, for the bulk sum of \$94,976.

Up to July, 1900, the circular head in the old dock had been removed, about half the stone required for the new work quarried, and some 30,000 cubic yards of rock excavated.

The concrete and masonry work proper was commenced September 20, 1900, and was pushed with so much vigour that it was completed by the 1st of December of the same year.

The whole of the work to be done consisted in the blasting and removing of 38,000 cubic yards of rock ; the building of 3,500 cubic yards of concrete and stone masonry ; the removal and rebuilding of circular head, stairs and timber slides, and of part of the old walls to bind courses with new work ; road surfacing, drains, and the placing of 6 new cast iron bollards and 60 keel blocks.

Rock excavation was completed in August, and preparations were made at once to start the concrete foundations.

After placing the necessary drains, concrete was deposited in the bottom of the excavation, levelled and well rammed, and large stones forming the flooring placed on top of the concrete to conform with the shape of the flooring in the old dock. At the same time the walls forming the sides of the dock were built up of stones of the same thickness as those in the old walls, and backed with concrete. Four derricks placed at coping level around the excavation, were used in handling the stone and material for concrete. The reach of these derricks covered the whole work, permitting the building up of the walls and the laying of the flooring in a most systematic manner, and allowing of good progress being made.



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All the stone used was grey limestone from the Terrebonne quarries of the same colour as that in the old walls, and proved to be of very good quality.

Only Portland cement was allowed in the work, and the following quantity and brands were used :—

'Citadel' Silicate Portland cement.. . . . . .	3,850 barrels.
'Hercules' Portland cement.. . . . . .	500 "
'Josson' Portland cement.. . . . . .	806 "
<hr/>	
Total number of barrels.. . . . . .	5,156

This cement was delivered at the dock in several shipments, and was stored and sampled out for testing purposes before being allowed in the work. Samples of the cement were in every case forwarded to the departmental testing laboratory and carefully tested.

The concrete under the paved floor of the dock and at the back of the side walls, is composed of 1 part Portland cement and 6 parts of sand and freshly broken stone, excepting under the central portion of the flooring, for a width of 20 feet, which is 5 to 1 concrete. The concrete around the arterial drains under the foundations and at the back of the wall was made porous so as to allow the spring water to find free access to the drains.

The present surface drain was also continued for the full length of the new extension and around the head of the dock.

During the execution of this work the docking and undocking of vessels was not stopped, the works being allowed to be flooded. When this occurred, after the emptying of the basin, all deposits of mud or slush caused by flooding were thoroughly washed off, before the masonry work was allowed to be continued.

A road 40 feet wide was cut into the rock around the circular head of the dock and on the sides, and the road surfaced level with the coping stones with one foot of broken stone and cinders.

The whole of the work was done in a very satisfactory manner.

Expenditure during the fiscal year :—

Maintenance .. . . . . .	\$ 8,767 27
Construction.. . . . . .	75,150 64
<hr/>	
Total.. . . . . .	\$83,917 91

Total expenditure to June 30, 1901, is \$1,020,431.58.

## ESQUIMAULT GRAVING DOCK.

There has been no extraordinary expenditure on this service during the past fiscal year. The water service was slightly enhanced by the purchase of a new meter, as the old one in use was worn out and recording inaccurately.

Some changes became necessary in the working staff, owing to the death of Chief Engineer A. C. Muir, after a short illness, on December 21, 1900. His son, W. J. Muir, who had been acting as second engineer under his father, was appointed temporarily in his place, and resigned his position on the appointment of Jno. E. Jeffcott to the position of chief engineer. F. W. Jones, who had been acting as fireman, was promoted to Muir's place. The new men have proved good officers, and the service is efficiently administered.

There were 25 vessels, aggregating 46,339 tons, docked during the year, and occupied it two hundred and eleven days, for which services the dues collected amounted to the sum of \$12,347.88.



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The only new work done during the year was some 195 feet of 2½-inch, 2-inch and 1½-inch water pipe laid 3 feet deep between the Esquimalt Water Company's mains and the engine-rooms, and a new 1½-inch injector fitted to the boilers, and new water-meter put in the mains.

Beyond doing the above work and attending to docking the ships, the staff were employed variously, keeping the establishment in good working order, and ready to take in vessels at the shortest notice.

In connection with the graving dock, an agreement exists between the Imperial and Dominion governments, in consideration of certain aid given by the former to its construction, by which, for a period of fifteen years from its completion, or June 20, 1887, all Her Majesty's ships should have a priority of entrance and free dockage, that is, only the actual running expenses should be charged against the Imperial government. This agreement, therefore, terminates on June 20, 1902, or before the expiration of the present fiscal year of 1901-2. Upon what terms these or other privileges are to be continued in the future is a matter for the consideration and adjustment by the respective governments.

Attached to this report in Part 6 will be found the usual list of the number and names of the vessels docked and revenue collected for the year ended June 30, 1901. The Marine Railway, in Esquimalt harbour, owned by Bullen Bros., is a strong competitor, and in consequence, our revenue from this source is materially affected.

#### KINGSTON DRY DOCK.

Kingston is situated at the outlet of Lake Ontario, 172 miles west of Montreal, and is an important commercial centre.

*Construction.*—In 1888 the construction of a dry dock, located near the centre of Kingston harbour, was commenced, and was completed in 1892, at a cost of \$461,097.72.

It is built of limestone laid in cement mortar; has good yard accommodation, and can take in any vessel that passes through the Welland canal; the depth of water on the sill being 14½ feet at low water, and 16½ feet at high water.

The general plan of this dock is a rectangular figure. The length from the foot of the stairway, at its head over the keel blocks, and up to the inner invert, is 280 feet. This invert is 10 feet wide; hence from the inner side of the caisson to the foot of the stairs the distance is 290 feet. By placing the caisson gate out on the apron, the last-mentioned length can be increased by 23 feet to 313 feet. The length at coping level from the outer end or lake face of the wing walls of the dock to the top of the stairway at its head is 370 feet. The width of the dock between walls is 47 feet at floor level and 70 feet at coping level. Its depth from the top of coping to the floor at the sides is 20 feet 6 inches, the radius of the inverts being 193 feet. The rudder well commences at 10 feet from the face of the inner invert and is 2½ feet wide, 24 feet long. 12-foot keel blocks are placed at 5-foot centres from end to end of the dock; there are also 32 bilge blocks at 10-foot centres on the floor of the dock.

The caisson is 59 feet in length on long face, 57 feet on short face, 13 feet wide by 22 feet deep. It is operated by a worm-gear arrangement in connection with the auxiliary engines.

The tonnage of vessels docked during the fiscal year was 20,159 tons.

The expenditure for maintenance and repair was \$6,132.75.

Total expenditure to June 30, 1901, is \$513,089.04 for construction and repair, and \$56,249.74 for maintenance.



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## SLIDES AND BOOMS.

The Dominion government owns and operates slide and boom works built to facilitate the passage of square timber, round logs, flatted and dimension timber, &c., on the River Ottawa and tributaries, on the lower 40 miles or so of the St. Maurice, and in the Trent and Newcastle district between Fenelon Falls and Heeley's Falls.

In the subjoined reports, the superintending engineers of these river works, Messrs. G. P. Brophy, F. X. Thos. Berlinguet, and S. Clegg, give particulars relative to the works of construction, improvement and repair carried out under their supervision on government slides, booms, piers, dams, streams, buildings, &c., during the fiscal year, the expenditures incurred for staff, maintainance, improvements, &c., the quantities of the various descriptions of timber that pass through their works, and other information of general interest and utility to lumbermen and the public at large.

## REPORT ON THE OTTAWA RIVER WORKS.

(BY G. P. BROPHY, SUPERINTENDING ENGINEER.)

The Acting Chief Engineer  
of the Public Works of Canada,  
Ottawa.

OTTAWA, September 21, 1901.

SIR,—According to instructions transmitted to me in your communication, No. 2221, dated July 9 last, I have the honour to transmit the following report on the works under my charge on the Ottawa river and certain of its tributaries, for the fiscal year ended June 30, 1901.

At the low water season of 1900, after the drives had passed, the foundations of the various river structures were examined and a commencement made of the necessary repairs. The work was continued during the winter and early spring months, in order that everything would be in readiness for the opening of navigation of 1901, and may be described as follows:—

## REPAIRS AT STATIONS ON THE OTTAWA RIVER (Main Stream).

*Carillon*.—Some minor repairs were effected to the apron of the slide; the work was done by the men engaged during the running season.

*Hull or North Chaudiere*.—When the water was let out of slide and hydraulic channels last fall, the slide works at this station were generally overhauled. A pier was built at entrance to upper slide on south side, and the bulkhead was rebuilt. Sheeting in sides and bottom of slide, cross sills, &c., were renewed and patched. Glances in channel at head of slide were patched; booms straightened, strengthened by screw bolts, fenders, &c., and rock bolts provided to secure ends of booms. A cabin for use of slide-master as a shelter and as a tool house was built on bulkhead. A fence was built along slide reserve to prevent parties making a public dumping ground on government property. At lower slide the sides were rebuilt, bottom raised to proper grade, and corners of piers patched where gouged out.



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*Ottawa or South Chaudiere.*—The tops of side piers of slide were repaired. A sluice was made in coffer dam to admit of the passing of logs and timber while water was shut out at north Chaudiere, so as not to cause delay to the stuff destined for the lower reaches of river. The necessary guide booms, stop-logs, &c., had to be provided in connection with this work. The bottom of slides were patched, breaks in booms were repaired, aprons adjusted, and chains renewed. Twenty-three stop-logs were provided for two upper bulkheads, while a portion of floor and cross sills of third slide was renewed. The ordinary repairs to general storehouses, sheds and fences were made to keep these works in serviceable condition.

*Chats.*—The repairs at this station were to planking in bottom of slide, and canal between the two bulkheads. A supply of elm plank was procured and laid in bottom of crib slide. Timbers of piers and glances were renewed in sides of canal leading to slides. The bulkheads were planked, hoisting gear adjusted and stop-logs provided. These works were carried out by the slidemaster and his assistants.

*Calumet.*—Some minor repairs to chains of sluicegates and apron of long slide were carried out by the staff at this station.

*Joachim.*—The tops of bulkheads and waste gates ; tops of booms, and sides of bulkheads were patched with 3-inch and 4-inch pine plank, and the bottom of the slide was repaired with pine sheeting 6 inches thick.

#### TRIBUTARIES OF THE OTTAWA.

*Gatineau River.*—The boom-fastenings, links, &c., were repaired; the tops of some of the piers supporting the main boom were renewed with timber, and additional stone filling was placed in the cribs. A supply of chains and ropes was provided for pocket and glance booms, and ordinary repairs were made to boats, scows, station-house and fences.

*Madawaska.*—At mouth, some bolts and washers were provided for booms, and an anchor pier was built and sunk to hold the boom in position. A supply of chain was furnished for booms at mouth of river, and at Arnprior station. For the Upper Madawaska a quantity of timber was purchased for repairs to booms at head of Calabogie lake, and for repairing slides, booms, piers and dams at High Falls and Chain rapids. The station house at High Falls was repaired, and some minor patching was done to slide and bulkhead at that place.

*Coulonge River.*—At High Falls station new chains were placed in main guide boom, and at pier No. 3 a new snubbing chain was set. The booms were generally patched, and a new brace boom was built near head of slide. The boom piers were patched at corners and on faces, where damaged. Sheeting in sides and bottom of slide, as well as sills and posts, were renewed, where worn out and decayed, and the slide structure at different places was brought up to proper grade, where it had become sagged.

*Coulonge Village.*—The boom was overhauled, the chains and fastenings being adjusted and the boom itself being tightened up to proper position. A portion of this boom was water-logged, and it was hauled to the river bank, where it was taken apart and placed in proper shape.

*Black River.*—Some small repairs were made to boom-fastenings, links and clevises being set in place.

*Petewawa River.*—The chains of the booms at the mouth of this river were examined, adjusted and renewed, as required.



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*First Chute Station.*—A break in the main boom was repaired, splice timbers and chains being used for this purpose.

*Second Chute Station.*—The flooring of the slide, near outlet, was relaid with new material, and the sides and bottom were patched where worn thin.

*Third Chute Station.*—The sheeting in sides and bottom of slide was patched, and the whole structure was caulked to render it water-tight.

*Bois Dur.*—A dam was built at head to divert water into log channel and a snubbing post set to secure boom to, at upper end. The plank and timber required for this pier were taken out of old slide, which has been abandoned at this place.

*Half Mile Station.*—Where holes were worn in face of dam, timbers were hewn and placed in position to render the structure serviceable.

*McDonald's Station.*—Iron bars were provided and secured to bottom and sides of the slide to prevent wear by passing timber and logs.

*Cedar Lake Station.*—A new floor was made in sluice-way to replace that carried away by spring floods. The three support piers immediately in rear of main dam were raised and stone-filled. A wing-dam was built at south end of main dam to close a channel worn there by high water in springtime. Some other repairs were also made to booms above dam and to sheeting on sides of sluice-gate piers.

*Dumoine River.*—Some forty bars of flat iron were set in bottom of slide at steep grades, and in sides of slide at curves, to protect sheeting from wear. These were secured by split or self-clinching spikes, specially made for the purpose.

*North and South Chaudière Stations.*—Repairs were made to side piers, bulkheads, booms, &c., of slide ; to storehouses, sheds and fences, all of which were either destroyed or damaged by fire on April 26, 1900.

*Black River—High Falls Station.*—At this station a portion of the slide at outlet—60 feet in length—was carried away in May, 1900. A large piece of rock, against which the slide structure rested, became undermined and toppled into chute, taking a section of the slide with it. As the bottom appeared sloping, it was feared a good foundation for building could not be had, the water also being quite deep, it was deemed best to divert the course of slide to west bank and carry it along the shore, where a solid foundation was obtained. The new portion of slide is built of square timber, bottom and sides, and is 200 feet in length.

*Reconstruction—Joachims Bridge Approaches.*—A start was made towards building the approaches to the new interprovincial bridge at Rapides-des-Joachims, now under course of construction ; the site of road has been cleared, and the roadbed formed in many places, projecting rocks, boulders, &c., having been blasted, and a quantity of gravel laid up to subgrade. The work will be continued when the stone abutments are all finished, so that the thoroughfare may be opened for traffic when the superstructure is in place.

The drives of 1900 were fairly successful in reaching their destination, and last spring a very favourable pitch of water prevailed for the early movement of timber ; but shortly after the freshets had run off, the river-drivers had to contend with low water conditions, so much so indeed, that it is feared many of the logs of 1901 taken from remote berths on some of the tributaries, will not get out this season.

The following statement, compiled from information furnished by the collector of revenue in your department, shows the quantity of the various descriptions of tim-



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ber that passed these works, and the revenue accrued thereon, during the fiscal year ended June 30, 1901 :—

	Pieces.
Square timber.. . . . .	894
Saw-logs.. . . . .	3,419,826
Boom and dimension timber.... . . . .	148,132
Cedars.... . . . .	67,239
Railroad ties.... . . . .	826,311
Fence posts.... . . . .	479,723
	<hr/>
	4,942,125

Also 20,784½ cords pulpwood.  
The revenue accrued on the above was \$43,831.50.  
In respectfully submitting the above,

I have the honour to be, sir,  
Your obedient servant,

GEO. P. BROPHY,  
*Superintending Engineer, Ottawa River Works.*



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## REPORT ON THE ST. MAURICE RIVER WORKS.

(By F. X. THOS. BERLINGUET, SUPERINTENDING ENGINEER.)

PUBLIC WORKS OF CANADA,  
RESIDENT ENGINEER'S OFFICE,  
THREE RIVERS, October 14, 1901.

EUGENE D. LAFLEUR, Esq.,  
Acting Chief Engineer,  
Department of Public Works,  
Ottawa.

SIR,—In compliance with the request in your letter dated July 9, I have the honour to submit the following report on the St. Maurice Works for the fiscal year 1900-1, ended June 30.

When the water was at its lowest pitch, and when the great bulk of the logs had passed, the foundations of the various structures were examined and repairs commenced. The work done under this head may be described as follows:—

*Grandes Piles Section.*—The construction of 1,511 lineal feet of five-ply booms ; the construction of three mooring piers, 30 feet square, at Pointe à Trudel ; also, the construction of two mooring piers, 30 feet square, at Pointe Madeleine, and the reconstruction of pier No. 2 from low-water mark.

At St. Jacques des Piles : six piers (Nos. 1, 2, 3, 5, 6 and 7) supporting retaining booms were repaired, also the house occupied by the boom-master. A number of boom chains were supplied. Stone ballast was put in the piers where necessary.

*Ste. Flore and Grande Mère Sections.*—The construction of 636 lineal feet of boom at the 'Petites Piles,' 2,207 lineal feet of five and six-ply booms, 32 inches thick, for the ten new sorting gaps at Grande Mère ; also, the construction of 1,873 lineal feet of three-ply booms in use at Pointe à Trahan, and 1,220 lineal feet of three-ply booms in use above the Hêtres falls.

*Petites Piles.*—Two piers (45 feet by 35 feet by 30 feet) supporting retaining booms were built to increase the capacity of the said boom, which is one of the most important for the assorting of logs at Grande Mère. It is to prevent a too great accumulation of logs at the assorting gaps. Nine snubbing piers were partially displaced by spring floods, the damaged portion was taken down and rebuilt. A scow forty feet by ten for the working of the booms was constructed.

*Pointe Trahan.*—Three piers supporting retaining booms were built, also a jam pier measuring forty feet square was built in thirty feet of water.

*Shawenigan and Les Gres Section.*

*Les Hêtres Falls.*—The construction of a dam across the western channel, also the construction of an anchor pier thirty feet square for the retaining boom above the falls.

*Pointe Marchessault.*—One pier thirty feet square was built at the entrance of the navigable channel to strengthen the booms.

*Pointe à Bernard.*—The construction of 2,935 lineal feet of five-ply booms. A number of boom chains and clevises were supplied. Nine piers supporting retaining



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booms partially displaced by spring flood were damaged, the damaged portion was taken down and rebuilt. One pier, thirty feet square, was built below the point for the erection of an assorting gap for the Shawinigan logs.

*Shawinigan Slide.*—The bottom and sides of the slide were repaired by replacing the worn-out timber and planking with new material, the apron faced with hardwood, and the projecting spikes in the bottom and sides of the slide were countersunk. The placing of a new gauge at the slide on April 10, 1901, being 7 inches lower than the previous one.

*Pointe Chevalier.*—At Shawinigan lower bay, on the 19th and 20th mile from the outlet of the river. This boom is 3,500 feet in length. It is one of the oldest on the river, having been built in 1852. One thousand two hundred and eighty-three lineal feet of three-ply boom were renewed, also six hundred and six lineal feet of five-ply boom. A number of boom chains and clevises were supplied.

*Pigeon Island.*—A retaining boom is formed by the closing of the western channel at the island above Grès Falls. Seven hundred and fifty lineal feet of seven-ply boom were rebuilt, also eight hundred and five lineal feet of six-ply boom. A jam pier, 30 feet by 25 feet, was built at the head of the booms at the outlet of the western channel.

*Three River Section.*—The construction of six thousand four hundred and eleven (6,411) lineal feet of three to seven-ply booms for the eastern, middle and western channels. Slight repairs were made to piers Nos. 9, 11, 22, 24, 26, 47, 58, 72, 59, 108 and 109.

All the repairs were completed in due time, and the works were ready for the business of 1901 on the opening of navigation.

The 'drives' of 1901 have been very difficult owing to the scarcity of water, to an alarming extent. The spring flood lasted only a very short time, and a great part of the logs are left in the tributaries, owing to the constant receding of the water which is partly attributed to the deforestation of that region. Some artificial means must therefore be taken to compensate and regulate the flow of the main river by constructing dams on the large tributaries flowing into the St. Maurice for the storage of water to be used in reducing the spring flood, and to be afterwards used when the spring flood is over. By so doing the lumbermen could have their logs a month sooner and would avoid the delay of waiting after the spring freshet is over to send their logs on the main river, and sufficient water would be retained to be used with advantage to continue the floating of the logs without any interruption.

The statement furnished by the collector of slide and boom dues, shows that 1,584,940 logs have passed the government works during the season 1900.

I have the honour to be, sir,

Your obedient servant,

F. X. THOS. BERLINGUET,

*Superintending Engineer.*



## REPORT OF THE TRENT AND NEWCASTLE DISTRICT WORKS.

(By S. CLEGG, SUPERINTENDING ENGINEER.)

SIR,—As requested by you in your communication No. 2222, dated July 9 last, I have the honour to submit the following report on the works under my charge on the Trent river and the waters tributary to it, for the year ended June 30, 1901.

These works extend from the Bay of Quinté on the south to Balsam lake on the north, a distance of about 170 miles. A glance at the map will show the immense number of small lakes that are in the counties of Peterborough, Victoria and the Haliburton district that empty into these waters. The Ontario government has built and is building some large dams on the northern lakes to enable them to control the water in the spring and have a more even flow during the whole year. This will greatly assist navigation and prevent heavy spring freshets. Since taking charge of this work on the 1st of March last, the following work has been done:—

## LITTLE LAKE PETERBOROUGH.

There are four piers and a two-stick boom about  $\frac{1}{2}$  mile long ; the work of removing the old pier base and building a new pier at the west end of boom was completed. The pier is 22 feet by 22 feet base, 18 feet by 18 feet top, and 19 feet high, sheathed with 2-inch plank to a depth of 7 feet on the west and south sides.

## KATCHAWANNOE LAKE.

The boom from Young's point to Lakefield, a distance of about  $4\frac{1}{2}$  miles, was overhauled and repaired ; new chains added where the old ones were defective, and the ends of the boom-sticks cut and rebored in places where the chains had drawn through the timber. Some of the anchors had to be moved.

## LOVESICK LAKE.

The boom had to be overhauled and quite a number of new chains put in.

## DEER BAY.

The boom was broken by the ice in the spring and had to be repaired. The ends were rebored, and some new chains provided to replace the defective ones.

## FENELON FALLS.

The boom was overhauled and placed in position, and 9 new stop-logs were put in the slide.

## BUCKHORN.

Three piers were repaired and new tops put on them.



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## MOUNT JULIAN.

Approach to wharf repaired.

## LINDSAY RIVER.

The work of dredging, started last year, could not be completed, on account of not being able to procure a dredge.

## OTONABEE RIVER.

The work of dredging and removing shoals from the river was completed, and the river greatly improved for navigation.

I have the honour to be, sir,

Your obedient servant,

S. CLEGG,

*Superintending Engineer.*

## BRIDGES AND ROADS.

It may be stated that, in the older provinces of the Dominion, the federal government has confined itself, as a rule, to take under its exclusive control and make provision towards the construction and maintenance of important interprovincial road bridges and bridges required across waterways.

In the sparsely settled districts of the North-west Territories, the government of Canada has undertaken to provide for the erection and maintenance of ordinary road bridges over large streams ; bridges that are urgently needed to afford uninterrupted communication through trails and highways of national importance, which neither the municipalities to be more immediately benefited by the structures, nor the territorial authorities most directly concerned, could be expected to erect and maintain at their sole expense.

During the last fiscal year, works have been executed on the following bridges:—

## OTTAWA BRIDGES, ETC.

## LAURIER BRIDGE (Maria Street).

This bridge over the Rideau canal, connecting Maria and Theodore streets, was first built in 1870-1, by the corporation of the city of Ottawa, the first cost being about \$9,000. It consisted in one wooden truss about 75 feet long, supported on trestle towers, and of short trestle approaches at both ends of the bridge.

In 1895 the Ottawa, Arnprior and Parry Sound Railway Company applied to the corporation of the city of Ottawa for permission to carry their line of railway across Theodore street by a subway to be constructed under the Maria street bridge, and the



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roadway of Theodore street adjoining the eastern side of the Rideau canal. This permission was granted and an agreement was reached between the two parties that in consideration of such permission the railway company agreed to construct and maintain, at its own expense, a wooden viaduct about 200 feet long with all necessary sidewalks and approaches across their line of railway crossing Theodore street. This extension was built the same year, and consisted of trestle bents about 16 feet distant centre to centre, supporting a plank roadway and walks, in all 28 feet wide.

It was further agreed that whenever the bridge would be replaced by a permanent structure, the company, at its own expense, would take down and remove the temporary wooden viaduct, and in lieu thereof at once build and for ever afterwards maintain and keep in repair a first-class iron viaduct about 200 feet in length to correspond in materials, style, height and width, with the plans and specification which might be adopted by the government of Canada or the corporation, or by both of them for the rebuilding of the Maria street bridge over the Rideau canal.

By another clause in the agreement the railway company agreed to assume all costs, damages and expenses of every nature and kind whatsoever which the corporation might be put to or have to pay by reason of the building, maintenance or repairs of the said viaduct and approaches.

Up to 1885 the city corporation maintained and kept in repair the portion of the bridge over the Rideau canal. However, previous to that year several petitions had been sent by the corporation asking the government to assume this work of maintenance and repairs. This was granted, and an arrangement entered into in 1885 between the government and the city of Ottawa for the maintenance, by the government, of the bridge over the canal, as authorized by Orders in Council passed on April 21, 1884, January 11, 1885, March 6, 1885, and June 17, 1885.

*Repairs.*—From 1885 to 1899 the total sum of \$4,200.14 was expended in various repairs to bridges, including the entire reconstruction of the wooden truss over the canal in 1891.

*Reconstruction.*—In 1897, as the bridge was much out of repair, and the necessity of rebuilding it entirely upon modern and suitable lines, was very apparent, some difficulty arose as to the actual legal signification of the word ‘maintenance’—(the government was bound to repair and maintain the bridge as per agreement and Orders in Council)—whether it meant reconstruction after the bridge in question became absolutely out of repair. Application was made to the Department of Justice for an expression of opinion in the matter, and the answer was as follows:—‘You are bound to repair so long as there is possibility of repairing; when there is no further possibility then you must reconstruct.’

In accordance with this, the government decided to rebuild a masonry and steel structure, the Ottawa, Arnprior and Parry Sound Railway, bearing the cost of the portion of the structure over their tracks as per their former agreement with the city of Ottawa.

Plans and specifications were prepared and tenders called for under three separate contracts, viz.: for the masonry substructure, for the steel superstructure, and for the concrete and metal flooring respectively.

The contract for the foundations and masonry was awarded April 9, 1900, to John Burns, of Ottawa, for a bulk sum of \$29,844 for the masonry, and for the piling in foundations, at the rate of 37 cents per lineal foot of piles left in the work. The work to be done consisted in the construction of two abutments, two canal piers, and twenty-four post piers between the railway tracks east of the canal, together with all the piling and concrete required for the foundations, and all necessary excavations and coffer-damming.

The contract for the steel superstructure was awarded June 28, 1900, to the Dominion Bridge, Company, Limited, for the bulk sum of \$35,297.



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The contract for the concrete and metal flooring was awarded to the Roebling Construction Company, of New York, for a bulk sum of \$6,398.

These contracts do not include the building of the west and east approaches, the granolithic walks and the stone pavement.

#### GENERAL DESCRIPTION.

The Laurier bridge has a total length of 344 feet from abutment to abutment, crosses the Rideau canal with an 80-foot span arch, has a 35-foot plate girder span on the west side of the canal over a roadway leading to the wharfs, and has a plate girder viaduct 226 feet in length, on the east side over the Canada Atlantic Railway Company's tracks. At the west end of the bridge there is an earth approach, 300 feet long, reaching the roadway level with a five per cent grade. On the east side the approach built on the same grade is about 150 feet long.

The bridge is notable mainly for the massive construction required for the heavy city traffic, for its skew, the piers and rows of columns in the viaduct work being laid parallel to the railway tracks and canal line, or at an angle of  $61^{\circ} 18'$  with the centre line of the bridge; it is also of interest on account of its parabolic profile on top, and its flooring system.

The portion over the railway tracks is divided into 7 spans, 31 feet 9 inches each (excepting the span adjoining the canal arch which is 35 feet long), supported on six viaduct bents composed of four vertical columns each, the bents being braced together in pairs to make towers.

The 24 columns in those bents are supported by 24 small stone piers, 3 feet square at top, and having a concrete and pile foundation.

The arch over the canal rises from low masonry piers, built of heavy stone and founded also on piles capped with a timber grillage and concrete.

Heavy stone abutments with wing walls having also piles for foundations form both ends of the bridge.

The clear headway under the canal arch is 27 feet, and under the railway viaduct, it varies from 19 to 24 feet.

The bridge carries 14 lamp posts, and is lighted with 28, 32 c.p. electric incandescent lamps.

#### MASONRY WORK AND CONSTRUCTION.

Work was commenced on the foundations about the end of May, 1900. Excavations for the abutments were carried down to a depth of 7 feet below water level in the canal, the sides of the excavations being cut down about vertical in a stiff clay material and shored as the work progressed. The contractor experienced no trouble on account of water in the abutment pits.

For the two canal piers supporting the 4 ribs of the canal arch, timber cofferdams were built in place, and puddled with clay. They were emptied by steam pumps, and material removed by derrick down to a depth of 10 feet below water level. Some trouble was experienced here on account of leakage through the quick sand and mud bottom; but the difficulty was easily overcome, and the leakage removed by hand and steam pumps.

The pits for the 24 post piers were carried down to a depth of 7 feet below track level, and sides supported by planks shored from side to side.

Cedar piles form the foundations of all the piers and abutments. The piles are capped with a grillage of 10-inch by 10-inch timbers, the space between the timbers being filled with concrete.

The length of the piles vary from 18 to 30 feet, and they were driven in every case to a firm gravel or hardpan stratum. The material passed through was mostly clay,



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but quick sand was encountered and caused no end of trouble, especially at the 3rd, 4th, 5th and 6th rows of post piers between the tracks, where piles, when about half way down, would sink about one foot and spring up about as much under each blow of the hammer. In some instances, pile driver and hammer were lifted by the piles, and the pile driver had to be tied down solidly. In some other instances, the pile when released of the weight of the hammer for some time would spring up as much as 6 feet. To overcome this difficulty, many expedients were tried. The piles were tried with sharp points, the small end cut square; or the butt end down without success. The most successful expedient was to have men strike the pile with very sharp steel pointed bars at the same time as the blow of the hammer was delivered, and jam at once the top end of their bars under heavy timber beams placed for this purpose. The tendency of the piles to rise would then be checked by the steel bars. This work was necessarily very slow, and much valuable time was lost. The tracks alongside the excavations had to be made safe and the many trains passing there had not to be interfered with. This was successfully done, however; no accidents and no delays whatever were caused to trains, and the piles were driven down to firm stratum in every case.

The total number of piles driven in foundations is as follows:—West abutment, 163; west canal pier, 110; east canal pier, 101; post piers, 101; east abutment, 152, or a total of 627, making in all 11,847 lineal feet of piling left in the work. The dead load on each pile varies from 7 to 15 tons.

The concrete used to fill the spaces between the timbers in the foundation platform on top of the piles was composed of one part cement, three parts sand, and five parts broken stone for the abutments and small post piers; and one part cement, two sand, and four of stone for the canal piers. The concrete was well rammed in every case, and brought up level with the top timber pieces. On this pile and concrete foundation the masonry was commenced. The stone used was quarried close to the Montreal road, about  $3\frac{1}{2}$  miles from Ottawa city, and about  $\frac{3}{4}$  of a mile east of what is known as the Robillard quarries. There, limestone in beds of 13 to 30 inches in thickness of good quality was found, and all the stone was prepared at the quarry, and delivered at the works ready to be used. The body of the abutments is made of rock face ashlar, the canal piers of roughly picked stone without projections, and all bridge seats, cap stones for post piers and skew backs in canal piers for the arches are made of the best selected cut stone.

The specification as attached to contract called for rubble masonry in abutments and canal piers. After the west abutment was about half built up, representations were made to the government that a change should be made from rubble to ashlar masonry, the reasons being that ashlar masonry would have a better appearance and be more in keeping with the rest of the bridge. The change was ordered, and by agreement with the contractor, he undertook to build up first class ashlar masonry, at an extra cost of \$2 per yard over the bulk sum of his contract. The quantity of masonry affected by the change was 2,200 cubic yards, making the extra sum to be paid to the contractor \$4,400. In addition a portion of the masonry already built had to be taken down and rebuilt at an additional cost of \$493.

The mortar used is composed of one part cement to three parts sand for the abutment and small piers, and one part cement, two of sand for the canal piers.

The top course of the canal piers is completely covered with very large stones, all laid in close contact, four of which form the skew backs of the arches spanning the canal.

The masonry and material were handled by three stiff-leg boom derricks.

There are about 250 yards of concrete and 200 yards of cut-stone masonry in the work, the remaining 2,600 yards being rubble and ashlar masonry.

In driving piles for the west abutment, a brick sewer was found about 1 foot below the foundation level, passing under the wing walls. By agreement with the contractor, this sewer was reinforced with concrete, extra piles driven on both sides, and extra caps laid in the foundation grillage on top of the sewer, at an extra cost of \$460.



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A gas main pipe 12 inches in diameter was also found under the site of the new bridge. This pipe was diverted by the owners, the Ottawa Gas Company, at an extra cost, by agreement, of \$420.

#### SUPERSTRUCTURE.

The superstructure consists of 8 girder spans and 1 arch span, supported on trestle bents, piers and abutments. There are 4 lines of main longitudinal girders, 3 feet deep, carrying a roadway 38 feet wide and two 8-foot cantilever sidewalks.

These girders are supported, commencing from the east side, first, on the east abutment, thence on 6 bents of 4 columns each, erected on stone pedestals, the distance between the bents being 31 feet 9 inches, giving room for two railway tracks between each bent. From the 6th bent the girders reach another set of 4 columns which are pin-connected to the girders and to steel plates riveted to the bottom portion of the arch rings, exactly above the centre of the cast-iron shoe plates. Past these columns the girders are continued until they meet the arches. The bottom flange of the girders is then curved to the same radius of the extrados of the arch ribs, until the top flange angle is intersected by the curve. This part of the girders rest directly on the arch ribs and is riveted to their top flanges. The girders are connected in the same way to the arches on the west side, and are also supported on 4 pin-connected columns, thence to the west abutment.

The girders are braced in pairs with 'X' braces riveted to their bottom flanges, and are connected with floor 'I' beams, 18 inches high, every 7 feet 11 inches and 8 feet 3 inches.

They have vertical web stiffeners. Their inclination changes at every span; the grade rising in a parabolic curve from the east abutment to the centre of the arch span, then going down to meet the west abutment.

On account of this changing grade, there are wedge-shaped bed plates riveted to the lower flanges at every bent of columns (excepting where these are pin-connected to the girders), for bearings on the roller nests which are placed on top of every column to allow the expansion and contraction to take place in the girders without affecting the trestle towers. Each end of the girders at the abutments has wedge-shaped steel shoe plate, which slides on a corresponding bed-plate anchor bolted to the masonry.

The outside girders carry, riveted to their web and top flange, the sidewalk cantilever floor-beams. These sidewalk floor-beams or brackets have an outside line of web-connected 'I' beam stringers, which serve to carry the floor system. The posts for the railing are screw-bolted to the ends of these brackets.

The bent columns are made up of four 'Z' angle bars, riveted to a web plate to form an H-shaped cross section. They are connected in alternate pairs by longitudinal struts, and horizontal and transverse 'X' bracing, making every other span a tower. Knee braces, formed of perforated web and stiffening angles, are inserted longitudinally at the corner of the towers. Each column is anchor-bolted to the stone pedestals with anchor bolts about 3 feet long.

The arch ribs over the canal are made with web plates, angles, and cover plates. There are stiffeners at every 3 feet. The intrados is a segmental curve of 42 feet 8 inches radius, about 77 feet clear span and 25 feet 1 inch rise. The extrados is a segmental curve of 44 feet 2 inches radius, struck from a centre 16 3-16 inches higher than for the intrados curve. The top curve is, therefore, not parallel with the intrados, the depth of the ribs varying from 2 feet at the springing line to 2 feet 10 inches at the crown.

The toe of the arches is hinged to heavy cast-iron shoe plates fitting tight into recesses or skew backs cut into the masonry. These plates are bolted to the masonry with anchor bolts 3 feet long.

The arches are braced in pairs with latticed built beams, riveted at their radiating point between two large double plates. Each arch was shipped from the shops in three



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pieces. The two end pieces were first placed in position and supported on trestle work ; then the top piece was fitted between the two.

All of the iron work was handled with a stiff-leg boom derrick, travelling on rails laid on top of the metal work as it progressed. Most of the riveting and the whole of the reaming were done by compressed-air machines.

During the erection, the foot traffic was maintained, and a temporary foot-walk was built for that purpose at a cost of \$250.

## CONCRETE AND METAL FLOORING.

The system of flooring adopted consists, for the roadway, of wire-cloth arches stiffened by 'woven-in' steel rods sprung between the floor-beams and covered with concrete. The part under the sidewalks is what is called the flat system, composed of twisted steel bars connected every 18 inches with light steel bands.

Cinder concrete, composed of 1 part cement, 2 of sand, and 5 parts of locomotive cinders, was deposited on top of the wire clothing to a depth of 6 inches at the crown of the arches, covering entirely all the girders and floor-beams.

To render this flooring impervious to water, the surface of the concrete is covered with three thicknesses of roofing felt paper and tar, on top of which was laid, in a stone concrete bed, the sandstone block pavement. The sidewalks were finished with cement and crushed sandstone.

As the contract called for very severe tests to prove the strength of the flooring system, these tests were made and were as recorded below:

Work on concrete flooring started May 7, and completed June 12.

On June 13, the following tests were made:—

1. A distributed load of 1,200 pounds per square foot on the whole of a panel, 7 feet  $11\frac{1}{4}$  inches span, to obtain which, 120,000 pounds of paving blocks, &c., was used. The observed deflection was  $\frac{3}{8}$  inch.

The concrete was laid May 9; 36 days old when tested.

Proportions generally as follows:—One part cement, two parts sand, five parts locomotive cinders, and one part furnace ashes.

Cement used, 'Condor,' which gave at end of seven days, 508 pounds per square inch neat, and 97 pounds per square inch, 3·1 in tension.

This panel was exposed unprotected to heavy rain a short time after laying.

Weight of concrete in panel, nearly 8 tons.

2. A concentrated load of 6,000 pounds per square foot on 10 square feet

This test required 60,000 pounds of sandstone blocks, &c.

The observed deflection was  $\frac{3}{16}$  inch.

The concrete was laid May 7; 38 days old when tested, and same proportions used as stated in No. 1 test.

Cement used, 'Condor,' (slightly damaged by dampness at both ends of barrels), which gave at end of seven days, 501 pounds per square inch neat, and 103 pounds per square inch, 3·1 in tension.

3. A concentrated load of 10,000 pounds on one square foot.

There was no perceptible deflection for this test.

Concrete laid May 15; 29 days old when tested.

Cement used, 'Atlas,' which gave at end of seven days, 578 pounds per square inch neat, and 96 pounds per square inch, 3·1 in tension.

The thickness of concrete at the crown of the arches for the roadway is 6 inches.

Result: The tests were highly satisfactory.



APPROACHES.

The approaches at both ends of the bridge were built on a 5 per cent grade, the material used being sand, clay and stones. The roadway was surfaced with broken stone and screenings, then rolled compact. The Ottawa Improvement Commission's roller was used for this purpose.

At the east end of the bridge the raising of the roadway caused some claims for damages from the proprietors on both sides of the street. These were referred to the Canada Atlantic Railway Company, who, according to their agreement with the city of Ottawa, were obliged to settle all claims arising out of the construction of that portion of the bridge east of the canal. At the end of the fiscal year these claims were being looked into, and two of them settled.

At the west end there is still the permanent sidewalk for a length of 300 feet on the north side to complete, and some railing to place.

Expenditure during fiscal year, \$65,025.58.

Total amount paid up to June 30, 1901, \$76,408.69.

The Canada Atlantic Railway Company have already contributed a portion of their share to the cost of the bridge to the amount of \$17,615.

Their share, according to contracts, is as follows:—

*Masonry contract:*

Post piers between railway tracks, as per contract price..	\$ 1,324 00
Piling in foundation post piers, as per schedule price, 2,392	
lineal feet at 37 cents . . . . .	\$85 04

*Metal work:*

Steel superstructure above railway tracks, contract price..	17,615 00
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*Flooring contract:*

Portion of flooring, above railway tracks, contract price..	4,244 00
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Total . . . . .	\$24,063 04
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This will be increased to a little over \$27,000 when cost of stone pavement and sidewalks is added, and everything completed.

The bridge was opened to traffic on July 1, and at the end of the fiscal year very little remained to be done to complete it thoroughly.

SLIDE BRIDGES.

*Chaudière Bridges.*—After the necessary foundations, retaining walls, bridge seats, &c., were completed, the steel superstructure was proceeded with, and at end of period covered by this report, the work was well advanced towards completion: the thoroughfare being opened for traffic by middle of July last.

*Hull Slide Bridge.*—When the water was out of the slide and hydraulic channels at site of this bridge, advantage was taken of this unwatering to set foundations for new structure. These were carried up to a point above ordinary water level. (Since June 30 last, the new steel structure has been erected and was opened for traffic on August 17 last.)

While these two bridges were being rebuilt, temporary roadways, sidewalks, &c., had to be maintained to accommodate the traffic.



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## BRIDGES AT OTTAWA AND HULL, AND ROADWAY APPROACHES.

The iron work of both Sappers' and Dufferin bridges was painted. Old paint, rust, and dirt had first to be scraped off before new material was applied.

A portion of the truss of the Union bridge received a coat of paint. The roadway was patched and scraped from time to time, and the sidewalks were repaired.

The crib-work pier supporting the old Hull Slide bridge was removed to make room for the new steel structure.

A portion of the pavement on the Hull causeway, near the northerly approach to the Union bridge, leading to the lumber yards, was taken up and relaid on concrete foundation, as it was found that the ordinary sand foundation would not withstand the very heavy traffic at this place. The causeway was cleaned from time to time, as was found necessary, water-holes were opened, gratings were cleaned, and railings, guards and sidewalks were patched.

During the winter months surplus ice and snow were removed from the sidewalks and causeway, and from Hull and Union bridges, so as to keep these thoroughfares in condition for the heavy traffic which has to be accommodated in that section.

## DES JOACHIMS RAPIDS.

The village of Des Joachims is on the Ottawa river, in the county of Pontiac, 45 miles above Pembroke, and 130 miles from the city of Ottawa. In 1900 the department decided to replace the wooden bridge across the Ottawa river at Des Joachims rapids, which had collapsed a few years previously, by a steel structure with stone masonry substructure, at the site of and over the timber slide.

As the Ottawa river at this place is divided into two channels by an island, two separate structures were necessary, and are being constructed under separate contracts. In the fall of 1900 a contract was entered into with Messrs. Keating, Wilson & Boucher for the construction of the stone masonry piers and abutments for the bridge over the south channel of the river, and another contract with the Dominion Bridge Company for the superstructure. This bridge is to consist of one span of 227 feet, and two shore spans of 100 feet each. The construction of the stone substructure was completed at the end of March last; the erection of the superstructure had not been commenced at the end of the fiscal year.

The expenditure during the fiscal year was \$23,304.93.

## PORTAGE DU FORT.

Portage du Fort is on the north shore of the Ottawa river, in the county of Pontiac, 60 miles above the city of Ottawa.

In 1898 the wooden bridge across the Ottawa river at Portage du Fort fell down, and the communications between the provinces of Ontario and Quebec had to be established by means of rowboats. In 1899 the department decided to build a steel bridge, with stone masonry piers and abutments, at a place about  $\frac{1}{3}$  mile below the site of the old wooden bridge. In February, 1900, a contract was entered into with Messrs. Quinlan, Phippen & Robertson for the construction of the substructure, and another with the Berlin Bridge Company for the superstructure. The new bridge is to consist of one span of 300 feet, one of 50 feet and one of 30 feet.

The contract for the two piers and abutments was completed in the fall of 1900, and the approaches on both sides of the river were nearly completed at the end of the fiscal year, but the erection of the superstructure had not been commenced.

The expenditure during the fiscal year was \$10,442.87.



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## NORTH-WEST TERRITORIES.

## BATTLEFORD BRIDGE.

The bridge crossing the Battle river was constructed in 1890. The contractors having failed to carry out the work, the bridge was constructed by day labour. The timber had been upon the ground for two years previous, in consequence it was sun-cracked, warped and full of sand, which added to the cost of framing.

Temporary repairs were made to the bridge in January, 1900. The work done consisted in putting in three bents to hold the bridge up. Pending a decision as to its reconstruction, the ice flow in the spring carried away the above mentioned supports and left the bridge in the same condition in which it was when condemned, and the bridge fell June 7, 1900. The main span 150 feet, fell into the river, and another span, 70 feet on land, but the timber was ruined, the iron twisted and the removal of the wreck a bill of extra expense.

The old bridge consisted of one abutment and three piers; one span 150 feet in the clear, and two spans of 70 feet each, with trestle approach on north side.

The water having fallen sufficiently to allow a proper inspection of the piers, they were found good enough to support steel superstructure for at least five years. These piers need repairs, and must be properly rip-rapped; however, the stone is on the ground and the timber necessary to repair the piers can be procured here.

Battleford is situated in latitude  $52^{\circ} 42' 38''$ , longitude  $108^{\circ} 16' 59''$ . Mag. bearing,  $22^{\circ} 50'$  east. Altitude 1,620 feet above sea level.

BATTLE RIVER BRIDGE, BATTLEFORD (*Temporary*).

In compliance with instructions, a temporary bridge was erected at Battleford across the Battle river in May last (1901).

The water, after ice ran out on April 20 last (1901), remained very high, more than bank full, flooding the flat and receding so slowly that it did not reach a stage at which the work of erecting the bridge could be executed with despatch, or to the betterment of public convenience.

The bridge consists of eighteen bents, placed 12-feet centres, 11 feet wide (between guard rails) and 243 feet long.

The bed of the river is quicksand, and it is difficult to build a temporary bridge that will keep its shape, so mud sills were put on at right angles, which has kept the bridge in shape much better than formerly.

To make this bridge sufficiently strong to withstand the strain of bands of cattle and horses crossing it in numbers (that is, filled from end to end), diagonal braces and horizontal braces were put on.

During high water, however, debris lodged on two of the bents and dislodged them, so that it made it necessary to put them in their proper place again. The cost of the temporary bridge was \$299.81. This bridge is considered the best and strongest that has ever been erected, and in the shortest time (traffic in four days, completed in five).

## BELLY RIVER BRIDGE, LETHBRIDGE.

The Belly River bridge is built over the Belly river, about  $1\frac{1}{2}$  miles from the town of Lethbridge. The bridge was built under contract in 1892, and consists of three piers and two abutments, with trestle approach on east side. The superstructure is 'Howe' truss, and the spans are 150 feet in the clear.



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Lethbridge is situated in southern Alberta, on the Crow's Nest Railway, 109 miles west of Dunmore, on the main line of the Canadian Pacific Railway. There is a branch line running out of Lethbridge to Great Falls. The 'Galt' mines (coal) are operated at Lethbridge.

Work of repair began February 26. The sheathing was cut down below the damaged part and fitted in timber, giving the uniform surface, as originally built. The damaged noses of the piers were fitted with heavy timber. The piers were then finished by putting on boiler plate to replace that which had been carried away, as well as putting on pieces running from nose plate to corner plate.

The east approach was improved by throwing the railing where it closed upon the road at a greater angle, and filled in with earth. This improvement gives ample room for string teams to make the turn with ease; formerly, they were obliged to run the leaders up the hillside.

The sum expended upon repairs was \$568.80, and the work closed March 9, 1901.

## EDMONTON BRIDGE.

Edmonton is situated in Northern Alberta, on the north side of the north branch of the Saskatchewan river, and 194 miles north of Calgary. The Edmonton branch of the Canadian Pacific Railway connects with the main line at Calgary.

A bridge was constructed across the Saskatchewan river at Edmonton, consisting of three piers and two abutments in concrete with steel superstructure. It is a combined traffic and railway bridge. It was opened for traffic in April, 1900, and painted in June of the same year.

In June, 1900, a semi-circular nose (in wood) was placed on pier No. 1, in order to obviate, as much as possible, the accumulation of debris during high water and to facilitate the removal of what might accumulate.

To protect this wooden nose from the ice flow in the spring, boiler plate was put on.

The boiler plates had to be purchased in Winnipeg (Vulcan Iron Company) and were put on in April, 1901, before the ice moved out.

The sum expended was \$102.54.

## LANGEVIN BRIDGE, CALGARY.

Calgary is situated on the Bow river, also on the main line of the Canadian Pacific Railway, and is commonly considered a central point on the line dividing northern and southern Alberta.

There are two branches of the Canadian Pacific Railway running out of Calgary, one to Edmonton and the other to Macleod, where it connects with the Crow's Nest Railway.

The 'Langevin' bridge over the Bow river at Calgary is a 'Howe' truss, and consists of two piers and two abutments with trestle approach on south side.

In May last, the bridge was well up to proper camber, but the planking was much decayed in places, so much so, that the entire length of the bridge will need reflooring, certainly not later than next spring. It will also be necessary to carefully inspect the floor joists, as some are much decayed.

Some urgent repairs were made in February last.

The sum expended was \$81.50.

## OLD MAN'S RIVER BRIDGE, MACLEOD.

Old Man's bridge spans the Old Man's river, about two miles west of the town of Macleod.



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Macleod is located on the Crow's Nest Railway, and is about 50 miles from the international boundary.

The bridge was built under contract in 1891. It is a 'Howe' truss, with one pier and two abutments. Trestle and earth embankment forms the approach on the north side, and an earth embankment on the south side. The embankment on north side was made from quite a long cutting, which also forms a portion of this approach. To prevent the snow from filling up this cutting a snow fence was erected on the west side of this cut.

In compliance with instructions work began November 1, 1900, and was completed February 21, 1901. The work of repairs consisted in grading the cutting and giving the road-bed such a crown that the water from melting snow or rain is now carried off by the side ditches and cannot run on the trestle portion of the bridge as it did formerly. The portion of the railing that had been stolen for fire-wood was replaced, as also the snow fence which had nearly all disappeared. The trestle bents were made practically new by cutting off the rotting piles where they were sound, putting sills under them and bracing the bents. The abutments were carefully repaired. Many of the face timbers were badly decayed, and were replaced by new timbers. The abutments were carefully rip-rapped. New chord blocks were put on both upper and lower chords. These blocks were of green oak, as dry oak could not be procured; after they were in place the bridge was screwed up to a fairly good camber. In consequence of the chord blocks being green and will shrink, it is of importance that the bridge be screwed up now. The pier was found in good repair. During high water, however, (June, 1900) a large hole was scoured out along one side of the pier. It is useless in these mountain streams to put in, as rip-rap, boulders gathered from the prairie, as they are more or less round, and roll one over the other until they are scattered down stream; so arrangements were made to place 50 yards of large angular blocks of stone in this hole and about the nose of the pier. Unfortunately the weather turned so mild that but a small quantity was placed, but this was put carefully about the nose, and no doubt has held during high water. This matter of rip-rap should be attended to during the season of best ice, as the 'Chinook' winds act upon the ice so much that it is unsafe during most part of some winter seasons.

The expenditure in connection with these repairs amounted to \$1,615.73.

## YUKON ROADS.

The locations of roads were specially to connect Dawson with the different creeks in the Dawson district.

### ELDORADO ROAD.

Four miles of road were built on the Eldorado from Ridge road to Caribou, on the Dominion. The road was changed in two places, and on the Dominion 1 mile was located, so as to avoid hills and straighten the road.

Repairs were made in many places on the Ridge road.

The winter trail, which runs from Lower Labarge to McKay's Post, 109 miles, was changed and repaired. The Nordenskiöld bridge was rebuilt.

One trail of 5½ miles, from White Horse to the Copper King copper mines, was built.

### GOLD RUN.

Has a length of 15 miles; was not completed by the contractors, who did not fulfil their contract, and cost \$11,960.



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## CEMENT.

DEPARTMENT OF PUBLIC WORKS,  
CEMENT LABORATORY, October 26, 1901.

E. D. LAFLEUR, Esq.,  
Acting Chief Engineer,  
Department of Public Works.

SIR,—I have the honour to inclose herewith the annual report of this branch of the department, for the year ended June 30, 1901.

I am, sir,

Your obedient servant,

GEO. E. PERLEY,  
*Engineer in Charge.*

Since June 30, 1901, all samples submitted to this branch have been tested as fully as possible and reported upon.

The Portland cements have been very much improved in all respects, especially those manufactured in Canada; the English cements are improving in fineness of grinding, the importers having awakened to the fact that the testing of cement has been placed upon a scientific basis and is most thorough, and the Canadian manufacturers are vying with one another to turn out the best article possible.

The cement industry has become largely increased within the last year, the Canadian Portland Cement Company has been formed, and embraces the cement works at Strathcona, Ont., and those at Marlbank, Ont. The Marlbank works were originally operated by Mr. Ira Hopper & Son, of Montreal; it was not a success. After lying idle a number of years, the Commercial Wood and Cement Company, of New York, bought the property and started the manufacture of Portland cement with the latest improved machinery, that of the wet process and rotary kiln. The cement turned out was of poor quality; the tensile and crushing tests were very low, the chemical analysis showing an abnormal amount of sulphur. This, in a good cement, should never be more than 1 to 2 per cent.

There was so much of this cement condemned that the company sold out to the Canadian Portland Cement Company, which has enlarged the plant and improved the ingredients, thus making a cement of good quality; the tests give excellent results, nearly equalling 'Star,' the brand manufactured at Strathcona.

The Owen Sound Cement Company have been making an excellent quality of Portland cement under the stationary kiln process; they have placed in position a set of rotary kilns, but have been unable to work them satisfactorily, and have, therefore, never placed any of the product so manufactured on the market.

The Owen Sound Portland Cement Company have a fully-equipped plant at Lakefield, Ont., but have not manufactured any cement as yet. Everything is of an up-to-date character, and all the latest machinery has been established; the motive power, I believe, is water, and electricity.

The Georgian Bay Portland Cement Company has started a cement works in the vicinity of Owen Sound, but we have not had any samples for test purposes, so can say nothing in regard to its capabilities.



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There is some talk of starting another manufactory in the same neighbourhood in the near future.

The Hull Portland Cement Company have done nothing since the fire of 1900. The St. Lawrence Portland Cement Company manufacture a silica Portland cement which has given good satisfaction in tests; it was used on the extension of the graving dock at St. Joseph de Lévis and Maria Street bridge, and after a few failures, came up to the requirements of the specifications, thus showing the advantage of the home manufacture, as any inequalities can be rectified and a good article procured, when the tests are looked after on a scientific basis.

There is a manufactory in the vicinity of Sherbrooke, Que., which manufactures a cement. The tests which have been made of it in this branch of the department have been very unsatisfactory.

These different places should be visited once a year to note the improvements, as the cement industry is growing to large proportions, and this has caused a keen rivalry between manufacturers to have up-to-date plant.

There have been made many tests in the laboratory of varied cements for different works, not only for this department, but for the Department of Railways and Canals, Marine and Fisheries, and Militia.

The Cement Laboratory is a bureau for information in reference to cement, plaster, rock, clay and anything of a cementitious nature. The varied information requires a great deal of study and the aptitude to give an opinion at very short notice on all subjects connected with masonry and everything pertaining thereto.

In all cement that has been imported by water it will be found that the cement has lumped by the attraction of moisture from the bilge water in the hold of the vessel. This moisture is not sufficient to cause the full action of the cement, but is sufficient to cause the cement to chemically knit together. It can be squeezed between the thumb and finger into powder; but when it is placed on sand without being powdered, it retains its lumpy form, and when water is added, the lumps still remain, and the cementitious power of that amount of cement is lost, thus weakening the work expected from the proportions of material used.

It has been stated that this has so materially affected the work that in one case a flour mill plant was set up, and the cement reground before it was used.

The cement proved to give good satisfaction after being reground.

An amount might be asked to suitably equip the laboratory and allow of proper inspection of all manufactories, not only in Canada but the United States, as at present a great quantity of American cement is imported, both natural rock Portland and the true Portland cement. It has been found that the natural is similar to the Belgian natural, its life is from six to nine months, then deterioration begins, it is an uncertain quantity, and should only be sanctioned for use after long time tests.

We have in the vats briquettes to be tested ranging from seven days to ten years.

The only cement that has been tested for over a year is Owen Sound 'Samson,' it shows a falling away after nine months, and continues to the three years test.

In my semi-annual report I drew attention to the question raised by those who use cement: If a barrel of cement weighs 400 pounds when it leaves the manufacturer's hands, what will it weigh when delivered on the work?

If it has been found that a cement when delivered weighs only 397 pounds, there has been a loss of 3 pounds, now in a consignment of say, 25,000 barrels with an average loss of 3 pounds, it will amount to 187.5 barrels, and this at say, \$2.75 per barrel, means a loss of \$515.63, and as cement fluctuates in price so the loss in cash will be more or less.

The loss per barrel not only means loss in money, but when the barrel is used as a unit of measurement it means a loss in strength of mortar and concrete.

This may seem a small matter, but when looked at from the above standpoint it becomes a large item in an extensive work where many barrels of cement are used.



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## CONCLUSION.

In reviewing the foregoing report, on works under my control, I beg leave to call your attention to the question of total expenditures on harbour works, such as piers, breakwaters and wharfs.

In past years these expenditures were at times given as reported by the engineer in charge, at others as reported by the accountant of the department. In my present report I have carefully gone over the expenditures and have accepted the accountant's statements as a basis of cost, as the engineers in charge usually report the actual amount expended on works without including the cost for preparation of plans, specifications, the advertising for tenders, &c.

Our harbour works have increased to such large proportions, that I purpose at an early date, with your sanction, to divide the Dominion into engineering districts and divisions so as to materially simplify the work; calling Prince Edward Island district No. 1 without any divisions; Nova Scotia, district No. 2, with probably three divisions; New Brunswick, No. 3, with two divisions; Quebec, No. 4, with three divisions; Ontario, No. 5, with two divisions; Manitoba, the North-west Territories and British Columbia being respectively districts No. 6, 7 and 8, without any divisions. By this system able engineers could be placed in charge of the districts with the requisite number of assistants under them in charge of the divisions. Maps of the Dominion could be prepared defining the boundaries of the districts and divisions so as to render any particular work more readily located and reported on, than at present.

At the end of the present fiscal year the number of piers, breakwaters and wharfs under my charge were, approximately:—

Nova Scotia . . . . .	191
Prince Edward Island . . . . .	49
New Brunswick . . . . .	72
Quebec . . . . .	133
Ontario . . . . .	64
Manitoba . . . . .	4
British Columbia (improvements) . . . . .	10
Total . . . . .	523

The following comparative table of expenditure by this branch may be of interest:—

	1895	1900	1901
Harbour works . . . . .	\$572,107 87	\$734,098 23	\$1,639,380 34
Dredging . . . . .	201,499 51	703,942 40	714,319 52
Other works . . . . .	193,977 64	321,228 50	419,187 99
Total . . . . .	\$967,585 02	\$1,759,269 13	\$2,772,887 85

The above amounts do not include salaries of staff. Although the expenditure, involving to a large extent increased labour and duties, has risen from \$967,000 in 1895 to \$2,772,000 in 1901, the cost for services and staff has hardly increased 20 per cent.

On account of the increase in the size of vessels now trading in the Dominion and using the harbours and waterways, our dredging operations have had to be increased to keep pace with the demands of trade; a perusal of the report on dredging will be of interest, and with our present and prospective fleet I expect that in a few years we will be abreast of all requirements and able to satisfy demands for adequate depth of water in all our harbours and waterways.



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In conclusion I assure you that without the efficient and conscientious help rendered by my assistants it would have been impossible to handle the enormous business connected with the works under the control of this branch of the service, and I take this opportunity of thanking them for the valuable services they have rendered.

EUGENE D. LAFLEUR,

*Acting Chief Engineer.*



APPENDIX TO PART IV

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REPORT

OF A

SURVEY OF THE FRENCH RIVER, ONT.







## FRENCH RIVER SURVEY.

OTTAWA September 9, 1901.

Honourable J. ISRAEL TARTE,  
Minister of Public Works,  
Ottawa.

SIR,—I have the honour to submit the following report, the result of a survey of the French river, made last winter, for the purpose of establishing, whether this stream could be adapted to a navigation of 20 foot draught between Georgian bay and Lake Nipissing ; also to furnish sufficient data from which accurate estimates of the work required could be obtained, should the scheme be found feasible.

The general course of this river is westerly with a sudden turn to the south before discharging its waters into Georgian bay.

It discharges all the surplus waters of Lake Nipissing into Georgian bay after a course of 61½ miles through a rocky country.

Following its course, from source to mouth, the river may be described as follows : For the first 12 miles of its course, or from a point called Frank's bay to the Chaudière falls, the river may be taken as an arm of the lake itself, and has often been called South-west arm of Lake Nipissing ; but in order to be more explicit in describing the proposed works along the whole system it is here assumed to form part of the French river.

The channel in this first stretch of river has an average width of one-half mile with slight contractions caused by numerous islands distributed along its course. Its depth is nowhere less than forty feet and usually more than a hundred.

Chaudière island divides the river below this into two branches called the North and Main branch. At the head of the Main branch the first serious obstacle to navigation is met with in the form of two big cascades, called the Chaudière falls. These falls have a total drop of 25·62 feet. About a mile below the Chaudière falls one of the first tributaries of the French river, called Restoul river, enters the Main branch. This river although very wide for a distance of two miles above its mouth contracts to a very narrow stream where a succession of rapids begins.

On the North branch the same descent exists in long and violent rapids.

After a course of 8 miles the North and Main branches again meet at the foot of Chaudière island where they form a wide expanse of water two miles in length, dotted with a large number of small islands. This 10 mile stretch of excellent navigation has a depth varying from 30 to 100 feet.

After this the river again divides into two branches, again called the North branch and the Main branch. Both flow parallel, 3 miles apart, in a westerly direction for a distance of 18 miles, when the course of the north branch suddenly turns due south, opening out into a succession of lakes for a distance of about 6 miles where it joins the Main branch.

The tract of land thus surrounded by the waters of these two branches is called Eighteen Miles island.

Navigation is again interrupted, from the head of the Main channel, just mentioned, for 5 miles of its course, by a succession of five rapids, having a total fall of 18·93 feet. The first of these is called Little Pine, then a mile farther down follows the Big Pine, after that Double rapid, Big Parisian and Little Parisian at the foot.



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The channel in this stretch of river is crooked and narrow at the rapids but elsewhere it has the required dimensions for all purposes.

From the foot of Five Mile rapids, the Main branch has a good, wide and straight channel for a distance of 11 miles, then follows through a jog forming two reversing curves at a point called 'L'Enfant Perdu,' after which it resumes its width for an additional distance of  $2\frac{1}{2}$  miles to the entrance of a narrow stretch of river which leads to the next obstruction to navigation called the Recollet falls. The above described stretch of river offers the most magnificent facilities for navigation, for a distance of nearly 14 miles.

The North branch is a much narrower stream, and its water surface has the same descent, consisting of four rapids at its head and a fall of about 10 feet at its foot.

From the junction of the two branches, three miles up stream, the Main channel of the French river expands to the southward into a broad sheet of still water, dotted with numerous large islands forming some narrow complicated channels which unite in a single stream.

At the south end of this expansion, the river empties a small portion of its waters into the Pickerel river through the Horse Shoe fall.

At the Recollet falls the whole body of water of the French river rushes down from a height of 7.04 feet. Below these falls the stream, which averages about 300 feet in width, flows between steep rocky banks in the same direction as the upper portion of the river for a reach of  $10\frac{1}{2}$  miles. Within that distance the river has a general depth of 30 feet; but is obstructed by a few bars and two small rapids, of a fall of 2 feet each, which obstruct navigation.

We have now reached a point where the Pickerel river joins its waters to that of the French.

Pickerel river is a very important tributary and carries a large body of water. It takes its rise in a number of lakes in the township of McConky. From its mouth up stream it has a parallel course to that of the French river for a distance of 14 miles where Kidd's landing is situated. From that point up to its source, for an additional length of 25 miles the river is mostly all rapids. At a point 2 miles above its outlet, the Pickerel river, at high water, discharges a portion of its waters through a channel that runs due south into Georgian bay after a course of 6 miles. This channel is called the eastern outlet of the French river.

From the mouth of Pickerel river downward, the French, for a distance of 1 miles, expands into large lakes, into one of which the Wahnapiatae river discharges its waters.

A portion of the waters of the French river is then carried into Georgian bay by the middle outlet which runs due south for a distance of 3 miles, then turns suddenly westward for  $1\frac{1}{2}$  miles more, where the Dalles rapids are reached, having a fall of 4.76 feet, to the level of Georgian bay. The larger volume of water is carried by the western outlet, otherwise called the Bad river, which discharges into Georgian bay, by several small channels, after an irregular course of 12 miles.

It may be said that the debouchement of the French river into Georgian bay is by several mouths, flowing through cleavages in the rock area, which form a sort of delta, 15 miles wide, along the coast.

The banks along the whole course of this river are for the most part rocky and barren, and the greatest portion bold and precipitous but nowhere rising to such an elevation as to be termed mountainous.

There are occasional patches of good land along the way but these do not appear to be of any great extent anywhere in the immediate vicinity of the river.

The route selected for navigation purposes originates at the outlet of Lake Nipissing, follows the main branch of the river and leads out into Georgian bay through the middle outlet, where a harbour is already established, and is navigated by large craft employed in the lumber trade.



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The knowledge obtained in the survey of the river has developed a very favourable opinion respecting this route ; the method of improvement is acceptable, and the project is matured.

The main branch of the French river was selected as being the most favourable to deep water improvement and the scheme to be resorted to, to obtain this result, is very simple. It is first purposed to divide the waterway from the foot of Chaudière falls, into two basins, by constructing dams to keep the water in the basins at a given head and to build suitable locks for the purpose of uniting its navigable parts above and below these dams. The dams will obliterate all existing rapids and raise the water surface considerably, but in order to attain a wide channel, of a depth of 20 feet, additional work will be required at certain points in widening and deepening. It is proposed to utilize the north branch for feeding and regulating the navigable channel.

No experimental work is involved in the development of a 20-foot waterway through the French river, so that no doubts need exist as to the practicability of its execution.

This route was thoroughly surveyed and tested from end to end, the sites for dams and locks were carefully selected with a view to the greatest possible efficiency and economy, and a complete plan was made, with soundings, levels, &c. (also showing the proposed improvements), upon which can be based an accurate estimate of the work required to obtain the desired result.

It is necessary to adopt a common plane of reference or datum, for profiles and water levels throughout the water system under consideration. This has been done with accuracy so that material changes in elevation are not anticipated in doing the work. According to the plan adopted the low water level of Lake Nipissing has an elevation of 100 feet : the water surface of the first basin, when formed, 82 feet ; that of the second basin 60 feet, and that of Georgian bay 38.63 feet, making a total fall of 61.37 feet. Therefore vessels engaged in trade in these waters will navigate on four different levels united by 3 locks, formed by 6 dams.

*To obtain elevations above the sea, add 540.97 feet to all elevations.*

The various interruptions to navigation along the course of the main branch will be described from the head downward with the proposed improvements required for 20-foot depth.

From the head, the river, for a long stretch, has a very wide channel, averaging nearly half a mile, that could easily be improved for deep draught navigation by the removal of four small reefs situated at 6, 7, 8 and 11 miles of distance, and by locating the channel, in a few places, with buoys and small lights. These reefs crop up from very deep water, as everywhere else this stretch of river has a minimum depth of 40 feet. This portion of the river has a westerly course.

At the eleventh (11th) mile of its course the river turns due south, in a radius of 2,000 feet, and again to the west at the 12th mile, on a radius of 1,000 feet, but the width and depth are ample except in the last curve where some excavation is required.

At the 12th mile the proposed channel follows an inlet, parallel to Chaudière falls, which leads to Chaudière portage, where it is proposed to cut through and build the first lift-lock to overcome the Chaudière falls. The channel, in this inlet of the river, will have to be deepened, and a few small islands obstructing the passage removed. The cut through the portage will be 1,400 feet long.

At the foot of the portage another inlet is reached where some deepening is required as far as the 13th mile. About a quarter of a mile farther down this passage narrows considerably, and a point will have to be removed to widen the channel. One-half mile farther down, Keeso's Point nearly crosses the river and forms a barrier to



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the straight course of the channel ; a cut 800 feet long will therefore have to be made through it. This cut will lead to a group of islets through which a channel 1,200 feet in length will have to be made. This channel opens out into the general course of the river at the 14th mile.

As far as the 22nd mile the river offers a very good stretch of navigable water with depths varying from 30 to 100 feet, and a width of quarter of a mile generally, with a few narrows formed by islands. The only improvements required in the distance is the removal of two small reefs which crop up from deep water at the 17th mile. It would be advisable, however, to locate this channel with a few buoys along its course.

At the 22nd mile we reach the head of the Five Mile rapids where a considerable amount of work is required in straightening and widening the channel. For 5 miles of its course the river is obstructed and contracted at points by five different rapids having a total fall of 18.93 feet. At the head is Little Pine rapids, through which a channel has to be made ; then follows the Big Pine, where the stream has to be widened ; after that the stream makes a sharp half circle around Point Edward, as this curve cannot be followed by large craft a cut has to be made through this point.

There we reach Double rapids, where the stream has to be widened again and, farther down, the course of the channel has to be straightened by removing a portion of Howl Point.

At the Big Parisian rapids the river is again contracted and some widening is required. Then we reach Bluff Island current, where extensive widening has to be done and a small island removed at the foot.

After this the stream has a minimum depth of 30 feet and sufficiently wide for a distance of one mile when the last of the five rapids, called the Little Parisian is met with. At the foot of this rapid a dam 400 feet in length has to be built of sufficient height to obliterate all the rapids above and regulate the water surface, and the second lift-lock is here located for the passage of vessels from one level to the other.

Another dam will also have to be built on the north branch to the same height, to act conjointly with that of the main branch in elevating the water and regulating the same.

Between the 27th and 28th mile a small amount of work is required in deepening a portion of the channel and removing an islet.

Down to the 41st mile of its course the river offers a splendid body of water for deep draught navigation, its width varying between 500 feet and 800 feet, and its depth from 30 to 100 feet. Within that stretch there is another jog in the stream at L'Enfant-Perdu, forming two reversing curves, but the widths and depths are ample. The two curves have a radius of 1,000 and 1,500 feet.

Between the 41st and 52½nd mile the river flows between steep granite banks 300 feet apart on an average. Although this stretch of river will have to be improved, for a short distance, at seven different points it offers good navigation between these points, with depths varying between 21 and 60 feet. Its course is almost on a straight line between parallel banks and in many places resembles artificial cuts made through rocky areas for canal purposes. The first improvements required in this stretch of river is at the head, where part of the channel has to be deepened for a length of 500 feet. The next is one and a half miles lower down where some deepening has also to be made for a length of 1,500 feet. The third point where improvement to the channel is required is at the Recollet rapid where two islets and a bar of rock obstruct the stream causing a fall of 7.04 feet. It is true that the fall will be obliterated by a raise of the water surface, but some excavation for a length of 200 feet will also be required to form a channel. The two next points are in the form of two small rapids of a total fall of 2 feet, situated near the 44th and 49th mile. These rapids are formed by bars of rock that cross the stream. Here also the fall will disappear when the surface water is raised, but deepening is also required for lengths of 140 and 250 feet. The next improvement is the removal of an islet situated in the centre of the channel.



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and the last point to be improved in this length of river is at the 51st mile where the channel has to be widened for a length of 800 feet.

Between the 52½nd and 58th mile the stream expands into lakes for part of the distance and is everywhere broad and deep, therefore easy to navigate. At the 55th mile it turns to the south at an angle of about 120 degrees, but in doing so forms a graceful curve with a radius of 1,700 feet.

At the 58th mile the river course again turns suddenly to the west. At this point a large amount of excavation is required to reduce the curve made by the stream. One-half mile below this turn the stream has to be widened for a length of 450 feet, and one-quarter of a mile lower down a rock obstructing the passage has to be removed.

At the 59th mile the Dalles rapids are reached. Through these the water drops from a height of 4.76 feet to the level of Georgian bay. At the head of this rapid a dam has to be built to form the second basin and regulate its head, and the third and last lift-lock is here located for the passage of vessels from the level of the second basin to that of Georgian bay.

Other dams will also have to be built at three other outlets of the river, called Eastern outlet, Bass creek and Bad river, to act conjointly with that of the Middle outlet in elevating the water surface and regulating the same. The location of these dams is shown on a general plan of the river.

Below lock No. 3 a channel has to be cut through points and inlets for a distance of 1,800 feet, when the river curves to the south with a radius of 1,670, and follows this course to the 61½st mile of its course where it discharges its waters into Georgian bay. In this last stretch of river some dredging and a small amount of excavation is required over a length of 4,000 feet.

From the mouth of the French river two sets of range lights guide the course of vessels, past the Bustard islands, which are situated 6 miles out. After this, vessels have a free course in the Georgian bay. These range lights, especially the inner lights, will have to be replaced by larger ones of modern build if the contemplated improvements are carried out.

By adding all the lengths of channel to be improved, distributed along the course of 61½ miles of river, an aggregate length of 6 miles is found. This means that when projected improvements are carried out for a formed length of 6 miles, this river will afford first-class navigation between Georgian bay and Lake Nipissing with a 20-foot draught.

The minimum width allowed for artificial channels is 150 feet and the depth 21 feet.

The country through which the French river flows is all occupied by the Laurentian formation, consisting of red and gray gneiss. The rock throughout the country, covered by the survey, appears to form a series of ridges, ranging N.E. and S.W. At the Recollect falls the rock is of a brick colour without any distinguishable lines of layers of stratification; it is supposed to be an intrusive syenite. The dip of the gneiss which below the Recollect falls points generally to the south-eastward, changes above the falls and becomes south-westerly, but higher up above the junction of the north and main branches, notwithstanding the numerous folds and twists which the rock formation presents, the prevalent dip is to the south-east.

With the above knowledge, of the formation of this country through which navigable channels will have to be made, it is not surprising to find that mostly all the excavations required has to be made in solid rock. In fact the rock excavation alone in these proposed works will amount to about one-half the total cost of the improvement to the French river.

This rock formation has a great advantage over other materials for hydraulic works of a permanent character. In this case the banks of the river for the whole distance will be rock, therefore no erosion is to be feared; the cuts through it will be permanent and their vertical sides will stand all action of the water for centuries.



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The water supply on the French river route is abundant for first class navigation, the summit level (Lake Nipissing) being supplied by a number of streams discharging their waters into it and the river being the only outlet. The minimum discharge of Lake Nipissing into the French river during the lowest stage of water is 2,926 cubic feet per second, and that of the French river into the Georgian bay through its different outlets, 5,579 cubic feet per second. This large increase is due to the supply the river receives along its course from the different tributaries.

The season of open navigation in the French river route will be limited by ice during the winter season, but navigation could be extended from April 15 to December 15 in the river proper—not speaking of the Great lakes which are almost capable of winter navigation if the intermediate channels could be kept open—which will afford 8 months of navigation. This navigation season agrees pretty well with that of the St. Lawrence between Montreal and the sea, the average of which is from April 19 to December 10.

The river runs through a region meagre in resources, but some development of the water powers may be expected, for operating pulp mills, when an outlet for navigation is established.

It was not intended in this report to embrace the statistical and economic topics which are connected with this work and justify its undertaking, but I may venture the opinion that the French river route, being an independent line, is bound to possess great value in future diversions of trade and its consideration is fully justified.

A wrong impression has been spread throughout the country, by the press, when referring to the scheme, by giving it the name 'canal,' when its adaption to navigation consists of improvements in the bed of the river only and the control of its water surface. In order to be a canal, the route, or part of it, would have to follow an artificial channel formed outside of the river bed, and as such is not the case, in the French river route, the word canal should not be used at all in describing these proposed works.

### DETAILS OF CONSTRUCTIONS.

The scheme being generally described above, a short review of the details of construction follows :—

The distribution of the different branches of the river offer special facilities for the execution of a large portion of the works contemplated in this scheme, as it is feasible in many places to unwater portions of the main channel and divert its waters into the other branches. The advantages that would be derived by the process are that the works would be executed more rapidly and satisfactorily and at less probable cost.

It is assumed that the character of the works to be executed along the course of this waterway, are to be sufficient for vessels of the largest and most economic type now engaged in trade in the great lakes, and in preparing plans for those works provisions should be made for the speedy handling of boats into and out of the locks, so as to obviate, to a certain extent, all objections that could be raised on account of delays in passing through them. The most profound economic improvements of modern times should also be adopted in the construction of the locks which should be powerful and rapid working.

In order to allow an easy ingress and egress to the large class of boats that will probably utilize these locks, and give them sufficient space, the lock chambers should have dimensions of 600 feet in length by 60 feet in width.

The above dimensions of locks will accommodate the lake fleet of the largest class. It is true that most of the vessels sailing the lakes are inside of the proportions expected on the route; but it is assumed that the grain trade to be carried on this line will demand the construction of vessels of the largest type now in use.



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Part of the lock chamber, always under water, is to be excavated by cutting slots on each side with channelling machines which will leave smooth walls upon which the upper portions of the chamber walls are to be built. As the substructure or lock chamber will be in solid rock only, the sidewalls above low water mark will have to be built of concrete, as no building stone is to be found in the French river district fit for masonry. The concrete can be made from rock obtained from the excavations.

It is purposed to allow 21 feet clear depth over the mitre sills of the locks so as to ensure a 20-foot passage, to prevent striking and grinding when a vessel moves out. The filling and emptying of the lock chamber will be made through culverts, in the side walls or placed on the bottom of the chamber, to be opened and shut by valves operated by electricity. It is purposed to also operate the gates by electricity and use the current for lighting purposes.

At both ends of each lock a wharf 600 feet long and 40 feet in width will be built for mooring vessels while they await their turn to pass through the locks. These wharfs are to be built of concrete.

The six dams to be built to elevate and regulate, at a given head, the water surface of the two basins, formed for the purpose of navigation, are to be built on the lines of the old stop-log system, but on a larger scale and with some improvements. The sluices between the piers and abutments are to be 25 feet wide and are to be closed up and regulated by sets of stop logs. The stop logs are to be held together with a link so as to leave a play of about 6 inches. The bottom log is to be fixed to the bottom of the sluices and the others moved up and down as required by the use of endless screws placed at both ends. The space left between the logs when they are raised will be closed up by a plate of iron. The play between each of these logs will form a difference of height sufficient to keep the water at a constant head. Rollers will be placed at the ends of each log so that the pressure on them is all taken on the rollers, thus the friction will be reduced to a minimum and small power is required to move the logs up or down. The piers and the foundations of these dams are to be built of concrete.

There is of course, no uncertainty as to material, foundation, &c., as the matter has been carefully investigated. The buoys and lights for the service should be the most modern of their respective kinds, and should be controlled by the parties in charge of the water route.

It may be practicable to build this great work in separate sections so that the whole system may be completed within a short period of time, say two years.

## ESTIMATE OF COST.

The estimate of the probable cost of the improvements required on the French river route to adapt it to a navigation of 20 feet draught amounts to \$4,200,000, and includes the following works :—

Rock excavation in channel and lock-pits ; channelling in channel and lock-pits ; concrete masonry of three locks ; lock gates, including one extra pair for each of the three locks ; electric power and its development and machinery for locks ; aqueducts for the three locks ; residences for lock-masters ; concrete wharfs at both ends of locks ; rip-rap foundations for wharfs ; concrete in the six dams ; stop-logs, machinery and bridging for the dams ; excavation machinery and bridging for the dams ; buoys and lights ; superintendence and contingencies.

## LAKE HURON.

During the present summer a cursory examination was made of the two routes on Lake Huron between Sault Ste. Marie and the mouth of the French river.

These routes may be termed inner and outer route. The inner route is



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situated between Manitoulin island and the mainland and is called north channel of Lake Huron ; while the outer route runs out through the open lake. Vessels sailing on the outer route from the Sault follow the River St. Mary channel and reach the open lake through the Detour Passage, where they run on bearings as far as French river harbour after a course of 148 miles.

The inner route also follows the St. Mary river to the lake, then runs through the Missisagua straits into the north channel of Lake Huron as far as French river after a course of 137 miles.

The inner route is the shorter by 11 miles, but is not available for vessels of a greater draught than 12 feet, on account of shallow water in the channel at Little Current, caused by a bar of rock crossing the passage, while the outer route affords deep draught navigation for the whole distance.

The outer route, although the longest of the two, has its advantages during fine weather, as it offers free navigation, but during stormy weather, which is prevalent during the fall season, the inner route would offer the necessary protection.

It is therefore assumed that the two routes would be followed at different times if some improvements were made at Little Current.

From a plan of the rock bar at Little Current made by Mr. E. D. Lafleur, C.E., in 1896, I have been able to find the probable cost of a cut 200 feet wide and 20 feet deep through this obstruction, and this improvement is estimated at \$200,000.

### LAKE NIPISSING.

An examination of Lake Nipissing was also made during the summer to find if a terminal harbour could be built on the north shore of the lake in close proximity to the railway, where a transfer of cargo has to be made. The examination was also made for the purpose of acquiring knowledge as to the height of the banks around the lake, to ascertain whether the surface of the lake could be raised without causing too much damage to riparian interests should it be found necessary to do so in the treatment of the French river system.

Longitudinally the great body of the lake lies as nearly as possible due east and west; the eastern end is open and exposed, having only two groups of islands near the middle, while the western extremity is completely filled with islands, so that it is scarcely possible to distinguish them from the mainland without following the coast.

In the examination the whole coast of the lake was followed around from North Bay back to the same point.

The south coast of the lake is bold and exposed, the land rocky and barren, while the greater part of the north and east coast is very low, descending to the waters' edge in broad and low sand beaches ; these shelving out far into the lake, at a very slight decline, render the approach to the shore impossible for deep draught vessels.

The principal streams which fall into Lake Nipissing are the Red Chalk river, the South river, the Little Mattawa, the Silver, the Sturgeon, the Veuve and the West rivers. The largest of these is the Sturgeon river which drains a large area of country, and is fed by a number of smaller streams along its course of over 50 miles. At the outlet of most of these streams large areas of low land are to be found, especially at the mouth of the Veuve and Sturgeon rivers. Here settlers have established themselves on these low lands and have quite a large tract under cultivation.

This examination, although only cursory, has nevertheless impressed me with the belief, that the flooding of a large area of land, would surely follow a raise of the surface of the lake.

In order to find a convenient site for a terminal harbour on the north shore, careful soundings were made in the lake along this coast with the following result :— The 21-foot contour line was located at a distance of 3 miles out from shore at North Bay ; but it was expected that this contour line would have reached closer



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in shore, to the westward, and a place was found opposite the Indian reserve, 4 miles west of North Bay wharf, where the 21-foot contour line of depth is to be found 4,000 feet out from shore.

This point has been selected as the most appropriate site for a terminal harbour, being within easy reach of the Canadian Pacific Railway's main line. A section of land (640 acres) on the lake front at the location of the harbour could be purchased on this reservation from the Indians at a small figure, and this would give enough space for development that will surely take place close to the terminal harbour.

In building this terminal harbour, it is purposed to drive close piling along the outlines of the work and fill the interior with material dredged out of the bottom of the harbour. This mode of construction will be found most economical and will form a beautiful harbour of large capacity.

In this harbour fully equipped, vessels employed in the grain trade can discharge cargo, grain will be elevated and shipped in cars to seaboard ports or destination.

To cross the lake and reach this port vessels can follow an almost straight course from the head of French river by passing between the Goose and Manitou islands, covering a distance of 18 miles.

The probable cost of construction of this harbour, not including any equipment, is estimated at \$450,000.

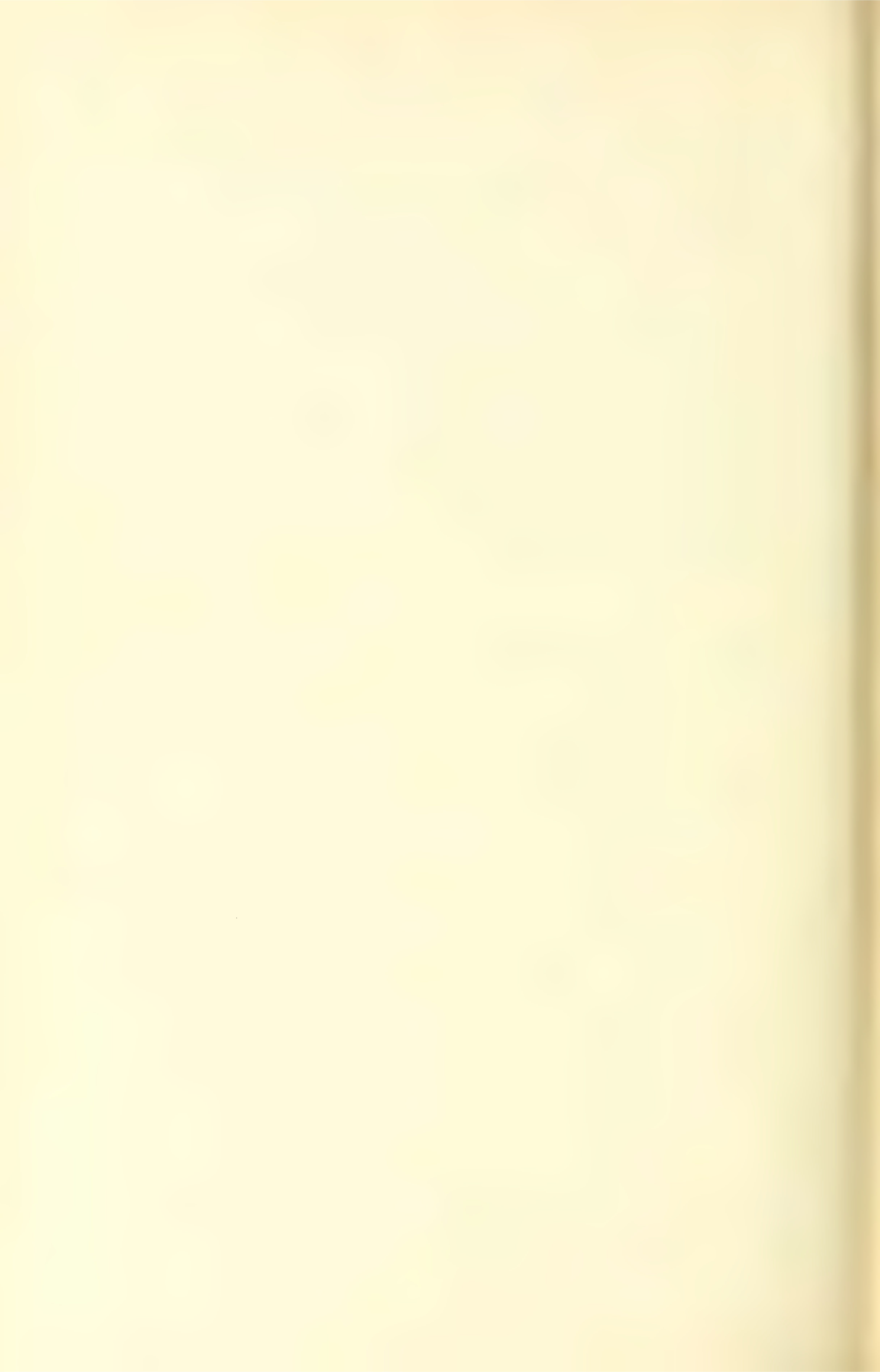
The whole respectfully submitted.

I remain, sir,

Your obedient servant,

J. W. FRASER.







PART V

REPORT ON GOVERNMENT TELEGRAPH LINES

FOR THE

FISCAL YEAR ENDED JUNE 30, 1901







DEPT. OF PUBLIC WORKS, OTTAWA, December 16, 1901.

F. GELINAS, Esq.,  
Secretary, Dept. of Public Works.

SIR,—I beg leave to submit herewith my report on the Government Telegraph Service for the twelve months ended June 30, 1901.

This report, in accordance with those of the past few years, is prefaced by a list to the present date of the land lines and cables in operation, with data of lengths, year of construction, number of offices at present established, and an estimate of the traffic handled in each instance.

The usual tabular statements, giving lists of the offices, operating staff, &c., in the several districts are appended to the report; likewise the tariff sheets showing the rates charged for messages on the several lines.

I have the honour to be, sir,

Your obedient servant,

D. H. KEELEY,  
*General Supt.*



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## GOVERNMENT TELEGRAPH SERVICE.

Location of Lines.	Points connected.	Year.	Length of Lines.			Number of Officers.	Yearly Average of Messages Sent.
			Land Lines.	Cables.	*Total.		
			Miles.	K'ts.			
Newfoundland.	Port au Basque—Cape Ray .....	1883	14	.....	14	2	..
Nova Scotia	North Sydney—Meat Cove (with loops) .....	1880-98	147½	.....	148½	14	3,000
	Across Bras d'Or Channel .....	1886	.....	.....	.....	.....	.....
	"    St. Ann's Harbour .....	1887	.....	.....	.....	.....	.....
	"    Ingonish Harbour .....	1887	.....	.....	.....	.....	.....
	Meat Cove—St. Paul's Island .....	1890	.....	20	23	2	50
	On St. Paul's Island .....	1890	3	.....	.....	.....	.....
	Mabou—Cheticamp .....	1887	63	.....	109	9	2,500
	Cheticamp—Meat Cove .....	1900	46	.....	.....	.....	.....
	Barrington—Cape Sable .....	1883	16	.....	.....	.....	.....
	Across Bear Point Channel .....	1883	.....	11	17½	Leased.	.....
	"    Lt. House Channel .....	1883	.....	.....	.....	.....	.....
New Brunswick.	Chatham—Escuminac .....	1885	42	.....	42	5	600
	<i>Bay of Fundy System:</i>						
	Eastport—Campobello .....	1880	.....	1½	.....	.....	.....
	On mainland Eastport .....	1880	.....	.....	.....	.....	.....
	On Campobello Island .....	1880	7½	.....	.....	.....	.....
	Campobello—Grand Manan .....	1880	.....	7½	44½	10	2,500
	On Grand Manan Island .....	1880	25½	.....	.....	.....	.....
	Grand Manan—Cheney's Island .....	1890	.....	.....	.....	.....	.....
	On Cheney's Island .....	1890	.....	.....	.....	.....	.....
	Cheney's Island—Whitehead Island .....	1890	.....	.....	.....	.....	.....
Quebec	Partridge Island—Fort Dufferin .....	1900	.....	.....	.....	.....	.....
	Bay St. Paul—Chicoutimi .....	1881	92	.....	92	7	.....
	Branch St. Alexis to L'Anse St. Jean .....	1898	40	.....	40	1	.....
	Murray Bay—Baie des Moutons .....	81 1900	733½	.....	.....	.....	12,000
	Across Saguenay River .....	1883	.....	1½	.....	.....	.....
	Bersimis to Manicouagan .....	1883	.....	12	772½	41	.....
	Manicouagan to Godbout .....	1883	.....	26	.....	.....	.....
	<i>Quarantine System:</i>						
	Quebec—L'Ange Gardien .....	1885	13	.....	.....	.....	.....
	L'Ange Gardien—Orleans Island .....	1885	.....	.....	.....	.....	.....
	On Orleans Island .....	1885	29½	.....	.....	.....	.....
	Orleans Island—Isle Réaux .....	1880	.....	2	52½	8	2,300
	On Isle Réaux .....	1880	2½	.....	.....	.....	.....
	Isle Réaux—Grosse Isle .....	1880	.....	2	.....	.....	.....
	On Grosse Isle (all told) .....	1885-94	3½	.....	.....	.....	.....
	<i>Anticosti System:</i>						
	Gaspé—L'Anse à Fougère .....	1881	28	.....	.....	.....	.....
	L'Anse à Fougère—Anticosti .....	1881	.....	44½	316½	10	1,500
	On Anticosti Island .....	1881-90	223½	.....	.....	.....	.....
	Anticosti—Long Point, Mingan .....	1880	.....	21	.....	.....	.....
	Meat Cove (C. B.)—Magdalen Islands .....	1880	.....	55	138½	9	2,000
	On Magdalen Islands .....	1881	83	.....	.....	.....	.....
Ontario.	<i>Pelee Island System:</i>						
	Leamington—Point Pelee .....	1880	12	.....	.....	.....	.....
	Point Pelee—Pelee Island .....	1880	.....	9½	.....	.....	.....
	On Pelee Island .....	1880-98	13½	.....	35	9	800
	.....	1900	.....	.....	.....	.....	.....
	Carried forward .....	.....	1,638½	208	1,846½	127	21,250

\* For convenience in totalling, the knots of cable are regarded as statute miles.



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GOVERNMENT TELEGRAPH LINES *Concluded*

Location of Lines.	Points connected.	Year.	Length of Lines.			Number of Offices	Yearly Average of Messages Sent.
			Land Lines.	Cables	Total		
			Miles.	K'ts.			
	Brought forward.		1,638½	208	1,846½	127	27,250
North-west...	Qu'Appelle—Edmonton and St. Albert.	1883-87	607½		607½	15	4,700
"	Moosejaw—Wood Mountain	1885	90½		90½	2	300
British Columbia	Ashcroft—Barkerville...	1878-87	276½		276½	9	4,500
"	Victoria—Cape Beale	1891	118		118		
"	Alberni—Cape Beale	1899	57		175	8	150
"	Nanaimo—Comox and Alberni	1893-95	110½		110½	10	7,000
"	Kamloops—Lower Nicola	1899	67		67	6	2,000
"	Ashcroft—Lillooet.....	1896	62		62	1	500
Yukon	Bennett—Dawson..	1899	564		639	16	30,000
"	Tagish—Atlin.	1899	75				
	Totals (1900)		3,606½	208	3,874½	194	76,400
	<i>Additions in 1901:</i>						
Quebec.	Baie des Moutons—Belle Isle.....	1901	254½	22½	276½	7	
"	Point Paradis—Scougalls Mills (loop).	1901	28		28	1	
"	Tadoussac—Sacre Coeur.	1901	12½		12½	1	
Ontario.....	Pelé Island Cable lengthened.....	1901		7½	7½		
British Columbia	Quesnelle—Athol	1901	885½				
"	Ashcroft—Quesnelle (reconstruction)	1901	215½		1,390½	26	
"	Dawson—Northern Boundary...	1901	90½				
"	Hazelton—Fort Simpson..	1901	198½				
"	Golden—Windermere	1901	82		2	2	
	Total to end of 1901.		5,433½	237½	5,671½	231	

\*For convenience in totalling, the knots of cable are regarded as statute miles.



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## REPORT ON THE GOVERNMENT TELEGRAPH SERVICE FOR 1900-1.

## EXPLANATORY NOTES.

The tabular statement prefacing this report shows the total mileage, &c., of the telegraph lines operated by the government. Lines that have been subsidized or constructed and transferred by the government for operation by private companies are not included in this list.

The matter in the following pages comprises merely a statement of specific actions taken in the course of the year, and in any case where no particular reference is made to a line found mentioned in the list, the understanding intended to be conveyed is that that line has been satisfactorily operated throughout the year, without any change of conditions since last made mention of in the annual reports.

## NEWFOUNDLAND.

The line from *Port au Basque* to *Cape Ray* continues to be operated as heretofore under an arrangement with the Anglo-American Telegraph Company.

## MARITIME PROVINCES.

*Mabou-Cheticamp and Meat Cove.*—The extension of this line to Meat Cove, which was completed in September, 1900, affords an alternative connection with the Western Union Telegraph system for the Magdalen islands and St. Paul's island cables landing at Meat Cove. The traffic is handled by either route, and the business is consequently expedited, and delays that would otherwise be experienced on occasions of interruption of a single line are obviated. Besides this, in consequence of the direct communication established, the local business which formerly passed over the connecting company's line and was subject to triple tolls, is now handled direct, the following tariff having been adopted upon the completion of the line:—

*Local messages.*—Between any two offices on the line, North Sydney to Mabou, 25 cents and 1 cent.

*Through messages.*—Exchanged between offices on the government line and Western Union or other connection, 15 cents and 1 cent.

*Night messages.*—Local, 1 cent per word, with minimum 25 cents. Through, 1 cent per word, with minimum 15 cents.

At *Grand Etang* the office was closed on August 31, 1900, the agent having resigned and no need being found for its continuance.

At *Broad Cove Mines* an accommodation office for the local railway was connected by loop into the main line (June, 1900), at the expense of the company.

*North Sydney-Meat Cove Line.*—Nothing beyond the general repair work noted in the last annual report was called for on this section up to the close of the fiscal year.

*Chatham-Escomincac Line.*—A proposal has been under treatment in the department looking to a lease of this line to the Miramichi Telephone Company.

*Bay of Fundy Lines.*—The cable between Cheney's island and Whitehead island was damaged by a vessel's anchor on December 8, 1900, but it was got in order again on the 27th by the local agent.



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## RIVER AND GULF ST. LAWRENCE.

*Anticosti Island Lines.*—In the autumn of 1900 the work of renewal of the line wire between English bay and Becscie river was carried out with the exception of a distance of about six miles for which additional material is being provided this season.

There was also a considerable amount of bush clearance made along the line generally by the regular lineman with local assistance.

The *District Superintendency* became vacant by the resignation of Miss Pope, and was put in charge of Mr. A. Malouin, agent at West Point, August 1, 1900.

At *South West Point* on the resignation of Miss Pope, Mr. A. Maloney temporarily transferred from the agency at Long Point was in charge till the middle of October, when he was relieved by Mr. F. X. Bertrand, who remained there in the capacity of teacher till June 1, 1901. Since that date the office has been in the hands of Miss L. Z. Lemieux, who had in the meantime become qualified for the position.

The cable between *Long Point* and *Mechastic Bay* ceased working on December 7, 1900. After examinations made near the shores the conclusion was arrived at that the trouble was in deep water. The cable consequently remained unrepaired until the past summer. (It was repaired by the ss. *Tyrian* on August 19). Connection between *Anticosti* and the mainland was throughout the interval maintained by the cable from *South West point* to *Gaspé*, and there was no interruption of the service.

*Magdalen Islands.*—In consequence of repeated recurrence of trouble with the sand-bar section between *Amherst* and *Etang du Nord* the laying of a cable to span this section was decided upon, and the work was to have been done in the course of the past season, but had to be deferred in consequence of more important calls for the cable ship elsewhere. It is intended to provide for this betterment being effected early next season.

In furtherance of the proposed main line connection with *House Harbour* mentioned in last year's report, it has been found desirable to at the same time extend the loop to *Pointe Basse*, a distance of about four miles. A supply of poles for this purpose, and for some required renewals along the existing line had to be obtained elsewhere, and in the course of the past season a small lot was arranged for at *Gaspé* to be delivered by schooner at the points required.

*St. Paul's Island Cable.*—This cable ceased working on November 24, 1900. When opportunity offered, examinations were made of both shore ends, but the interruption proved to be elsewhere, and nothing could be done until the cable ship was brought into requisition.

NOTE.—The ss. *Tyrian*, dealt with elsewhere in this report, visited the locality in the course of the past summer. The trouble, a break, was located  $12\frac{3}{4}$  miles from *St. Paul's island*. In the course of repair the cable was found greatly attenuated, and it broke repeatedly. The picked up lengths were overhauled and  $1\frac{1}{2}$  knots of new cable introduced to replace unserviceable portions, and a working connection was restored on July 20, 1901. There was still a defect in the circuit, a leak within a mile or so of *St. Paul's island end*, but in consequence of the services of the ship being elsewhere required, it was considered advisable to defer an attempt to clear it out until the next occasion for a repair causes it to be taken in hand.

*North Shore Lines.*—*St. Etienne* office which was reopened for a while in the summer was again closed on September 28, 1900. It is proposed to build a line spanning the existing gap between *St. Etienne* and *L'Anse St. Jean*, a distance of 15 miles; and a vote of \$1,800 has been obtained for this purpose. This new line will afford a second connection between *Chicoutimi* and the *North Shore system*, and will at the same time put the offices on the government lines, north of *Bay St. Paul* and *Murray Bay*, in direct communication.

*Scougall's Mill, Manicouagan.*—To accommodate the traffic to be had with the lumber mills at *Manicouagan*, a loop line was last spring built from a point off the main



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line near Point Paradis, to a special hut erected on the west side of the Manicouagan river opposite the mills, a distance of 14 miles. An operator from the mills visits this hut on occasion or at fixed periods for the exchange of business.

*Tadousac-Sacre Coeur.*—Provision was made in the estimates for the construction of a line to connect Sacre Coeur with the North Shore telegraph system at Tadousac, a distance of about 12½ miles. The work of establishing this connection is now in hand.

*Little River.*—An office was opened at this place, 15 miles west of Sheldrake, on November 26, 1900, with Miss E. Lebarge as agent-operator.

*Manicouagan.*—In December, 1900, a permit was granted to a local resident, Jos. Côté, for the occupancy of the telegraph building and premises at Manicouagan, which have been in disuse since the withdrawal of the office therefrom in the autumn of 1896. It is provided that the premises shall be vacated immediately in event of requirement.

*Extension to Belle Isle.*—The construction of the land line to connect with the cable to Belle Isle was resumed early in the course of the past season. At the time of the presentation of last year's report it was in operation as far as Baie des Moutons, 105 miles below Romaine; an office was opened at Harrington, 37 miles west of Baie des Moutons, on January 10, 1901, with Mrs. John Jones as agent-operator.

NOTE.—This line was completed through to Chateau Bay on July 10, 1901, and embraces offices, established in the course of the season, as hereunder:

	Miles.
St. Augustine.....	54
St. Paul river or Bonne Esperance .....	75
Blanc Sablon .....	35
Red Bay.....	54
Chateau Bay .....	35

(Add half mile Chateau Bay, and one mile Belle Isle for cable connections.)

The cable 22:26 knots from Chateau Bay to Belle Isle was laid by the ss. *Tyrian*, and the connection established on September 14, 1901.

The *tariff for Belle Isle* has been, for the present, fixed at 25 and 1 more than the rate to Chateau Bay, which latter is but 25 and 1 from Murray Bay, where connection is made with G. N. W. telegraph system.

*Wireless Telegraph Station.*—Immediately following upon the establishment of the cable connection between Belle Isle and Chateau Bay; arrangements were made and carried out for the establishment, at the same points, of two stations for the operation of the Marconi wireless telegraph. This system, as well as the cable, has since been operated daily, and it is expected uninterrupted communication will by this means be maintained with Belle Isle in event of the submarine cable becoming interrupted.

*Grosse Isle Quarantine Line.*—The cable section between St. François and Isle aux Reaux, which had been interrupted, and was restored to working order in May, 1900, became again interrupted on December 10, and in January the section between Isle Reaux and Grosse Isle also gave out. In view of these recurrences of trouble and of the contemplated action for betterment mentioned in last year's report, steps were taken for the importation of four quarter-knot lengths of the special locked armour shore end cable wherewith to effect the proposed change of landings and improvement in the connection. The new cable, however, did not arrive out in time for use when the season was far enough advanced to attempt another repair, and it is being held over at Quebec till next year. The stretches at present in use, including the L'Ange Gardien-St. Pierre section, which for the first time in its history had in the meantime also become interrupted through damage by ice, were overhauled as early as the work could well be got at, and the entire system was restored to working order again on the 22nd May.



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At *St. Petronille* the office was closed from November 20 till March 1 in consequence of the illness and absence of the agent-operator.

At *Grosse Isle* the former agent-operator, Miss Langlois, was succeeded by Miss Josephine Masson on the 1st May.

At *St. François* Miss O. Lemlin was appointed agent-operator from July 5, 1901, in place of Miss H. Lemlin resigned.

*Isle Coudres Telephone System.*—In the course of last autumn the working of this system was greatly improved and rendered much more satisfactory by the substitution, for the instruments formerly in use, of Bridging Bell apparatus, the same as was introduced at Grosse Isle some years ago. The work of installation was performed by an agent of the Bell Telephone Co.

*Signal Service.*—In connection with and as supplemental to the improvement in facilities for the handling of the signal service business, by providing a special wire between Quebec and St. Flavie, as mentioned in the last annual report; the contemplated shifting of our wire from the circuitous route of 28 miles to the short direct pole line of 12 miles built by the G. N. W. Tel. Co. (as mentioned under the head of *Anti-costi* in the report for 1898-9) was carried out in the course of the present season.

## ONTARIO.

*Pelée Island Line.*—The Pelée island cable which was placed in working order in June, 1900, was dragged through by a vessel's anchor off Point Pelée on November 27. As soon as the weather permitted thereafter an attempt was made by the district superintendent to effect repairs, but it had to be abandoned (December 27) till the season of 1901. In the course of the winter a new length of 8 knots of cable, I. R. core of our gulf deep sea type, weighing three tons per knot, the same as the length laid from the Dummy Light in 1898 was imported and laid down as part of a direct stretch of 17 miles from the north-west end of the island to Leamington dock; enough of the old cable being found sufficiently serviceable for utilization in re-establishing the connection by this route, which was selected for trial in preference to a much shorter one proposed to the eastward of the middle ground. This work of restoring the connection with Pelée island (completed on August 13, 1901) was performed by the district superintendent, Mr. J. McR. Selkirk, in conjunction with Mr. J. F. Richardson, electrical engineer of the Canadian Pacific Telegraphs.

A working agreement that had been entered into with the Bell Telephone Co. in January, 1880, for direct operation when practicable between stations on the company's lines and the Pelée island system, was terminated in October, 1899, because of the unreliable working conditions obtaining in the presence of frequent trouble with the cable circuit. Business for outside points has since then been handled at the company's Leamington exchange, and the facilities afforded appear to meet the requirements satisfactorily.

## NORTH-WEST.

*Qu'Appelle-Edmonton Line.*—In consequence of the pole line between Henrietta and Saskatoon being found to require renewal in sections, a lot of 400 poles (tamarack) was procured at Prince Albert and put in in the course of the present season. The entire line was gone over by the regular repairers in their respective sections, and the whole put in good order.

At *Battleford*, J. T. Callaghan, former lineman at Onion Lake, was transferred to Battleford as lineman, December 1, 1900.



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At *Star*, on the route of the main line, 6 miles west of Victoria, and 43 miles east of Fort Saskatchewan, an office was opened on May 28, 1901, with Mr. E. A. Holmes as agent-operator.

*Beaumont Line*.—The branch line from Edmonton to Beaumont, 15 miles, towards which assistance was granted by the contribution of the requisite wire, insulators, &c., as noted in the report for 1898-9, was completed on February 18, 1901.

## BRITISH COLUMBIA.

*Ashcroft-Dawson Line*.—The direct operation of the Barkerville line and branch to Lillooet, and of the Victoria-Cape Beale line, which had previously for several years been operated by the Canadian Pacific Railway Company for the government, in conjunction with the company's telegraph system, was resumed by the department, dating from May 1, 1901. Mr. Jas. Wilson, Supt. of the Canadian Pacific telegraphs, continued in charge pending a definite appointment to the district superintendency, and this was the arrangement obtaining at the close of the fiscal year.

(NOTE.—Under this plan of operation the joint office at Ashcroft becomes a transfer point and the terminal station for the through line to the Yukon. The through connection via Quesnelle, Hazelton and Atlin was completed on September 24, 1901, since when business has been handled by this direct route, thus obviating the delay of round-about transmission by mail boat between Victoria and Skagway.)

*Fort Simpson*.—In conjunction with the above line, a branch of 198½ miles was constructed between Hazelton and Fort Simpson on the coast, and was put in operation on the 13th June.

The tariffs established for these lines are as noted in the appendix.

At *115 Mile House*, the office was vacated by the resignation of the agent-operator, Mr. J. T. McIntosh, in June, 1901, and at *108 Mile House* an office was thereupon temporarily reopened.

*Ashcroft-Lillooet*.—A considerable amount of general repair work, pole resetting, &c., is called for on this line, and a sum will be included in the coming year's estimates for this purpose.

*Victoria-Cape Beale Line*.—At *Clo-oose*, the lineman, J. Vanslyke, resigned on March 6, 1901, and Otto Rosander was temporarily appointed to fill the position.

*Golden-Windermere*.—In the course of the year tenders were called for, and a contract entered into with Messrs. G. O'Kelly and A. Walkley for the supply of poles and construction of a line from Golden to Windermere, a distance of 82 miles. The work was carried out under the supervision of Mr. F. W. Aylmer, C.E., of Golden; and a proposal is being dealt with to extend this line by a loop or branch to Peterboro', near the Windermere end. Up to the close of the fiscal year the arrangements for staff and operation of the line had not been made.

*Alberni-Clayoquot*.—An exploration was made early in the year for a practicable route for a telegraph line between these two points, and arrangements are being made for carrying out the project under an appropriation made at the last session for that purpose.

## TELEGRAPH SERVICE GENERALLY.

*Cable Ship*.—In consequence of the loss of the ss. *Newfield*, noted in last year's report, it became necessary to provide a vessel for the past season's work. To this end the ss. *Tyrone* (an iron ship, registered as having been built in 1869, and of the follow-



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ing dimensions: Length, 237·5 feet; breadth, 30·2 feet; depth of hold, 19·9 feet; tonnage gross, 1,039; with H.P. 96, and screw propellor) was chartered and fitted out with the cable machinery and appliances that had formerly been in use on the *Newfield*. The fixing of the cable gear, tanks, &c., was done in a thoroughly solid manner under the immediate supervision of Mr. C. E. Stewart, formerly chief engineer of the ss. *Newfield*; and accidental displacements to which the heavy machinery might otherwise have been liable under stress of weather, were altogether obviated; there were no mishaps throughout the season's operations, and the ship answered her purpose admirably.

(NOTE.—As elsewhere mentioned in this report, the *Tyrian* in the course of the season was engaged in the repairing of the St. Paul's island cable, the Anticosti-Long Point cable, and the laying and subsequent repair of the cable between Belle Isle and Chateau Bay. The weather encountered was unusually foggy in the earlier part of the season, and frequently stormy in the latter part, so that the endurance and seaworthiness of the ship underwent a rigorous trial).

## REVENUE AND EXPENDITURE.

The revenue and expenditure for each of the lines in the several districts hereinbefore mentioned are given in the following table:—

Line	Expenditure.	Revenue.	Remarks.
Lower St. Lawrence and Montreal Province			
Albion Island line	2,259 99	708 79	
Belle Isle line	1,676 05	771 67	
Cape Ray " " " " " " " " " " " "	20 00		
Cape Sable " " " " " " " " " " " "	3 00		
Croft line	782 70	1,377 99	
Escuminac " " " " " " " " " " " "	467 11	163 47	
Low Point Agency " " " " " " " " " " " "	50 00		
Meat Cove line (including St. Paul's Island) " " " " " " " " " " " "	2,637 71	707 41	
North Shore St. Lawrence (East of Bersimis) " " " " " " " " " " " "	2,468 57	524 87	
" " " " (West of Bersimis) " " " " " " " " " " " "	5,781 81	1,841 98	
Quebec line	3,725 53	1,193 83	
Cable ship <i>Newfield</i> , renewals of plant, &c. " " " " " " " " " " " "	730 95	572 55	
Subsidies, stationery, line and office material and contingencies, chargeable to appropriation for Gulf lines. " " " " " " " " " " " "	1,174 71		
	10,213 84		
Total for Lower St. Lawrence &c.	32,251 38	7,981 35	
Ontario, Pelée Island line. " " " " " " " " " " " "	595 85	147 62	
North-west telegraph lines " " " " " " " " " " " "	16,461 34	2,672 36	
British Columbia, Comox (including Alberni line)	3,958 96	2,844 42	
Alberni-Cape-Beale " " " " " " " " " " " "	1,181 07	10 21	
Kamloops-Nicola " " " " " " " " " " " "	1,068 96	452 77	
Golden-Windermere line " " " " " " " " " " " "	6 41		
† Barkerville line " " " " " " " " " " " "	2,643 88		
† Victoria-Cape-Beale line. " " " " " " " " " " " "	3,440 78		
(Yukon) Bennett-Dawson & Atlin (see note*). " " " " " " " " " " " "	111,932 35	108,272 13	
Telegraph service generally. " " " " " " " " " " " "	2,355 53		
Total	175,896 49	122,560 86	

† The C.P.R. operating these two lines, retains the revenue, and the government reimburses them the excess of expenditure over revenue.

\* NOTE.—The above figures for the Yukon line, taken with those given in last year's report, represent the revenue from the outset. The maintenance charges are only such as could be distinguished, a considerable portion being inseparable from the construction accounts while the work is in progress.



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## DEPARTMENTAL TELEPHONE SERVICE.

At the end of June, 1901, the telephone connections with the central office of the Bell Telephone Co. at Ottawa, listed as chargeable to the special appropriation, numbered 177, the annual charge for which amounts to \$6,688. These connections are distributed amongst the several departments as hereunder:

Department.	Offices.	Residences.	Annual charge.
			\$ cts
Agriculture .....	5	5	370 00
Auditor General .....	1	1	90 00
Customs .....	3	1	150 00
Finance .....	2	3	155 00
Government House .....	3	2	260 00
House of Commons .....	8	3	405 00
Inland Revenue .....	2	3	195 00
Interior .....	9	5	520 00
Geological Survey .....	2		75 00
Mounted Police .....	2	1	120 00
Indian Affairs .....	4	1	185 00
Justice .....	6	5	400 00
Dominion Police .....	6	2	298 00
Marine and Fisheries .....	2	3	180 00
Militia and Defence .....	8	8	605 00
Post Office .....	5	1	220 00
Parliament Library .....	1	2	105 00
Privy Council .....	3	5	280 00
Railways and Canals .....	3	3	215 00
Secretary of State .....	2	3	180 00
Public Works .....	15	12	1,035 00
Ottawa River Works .....	3		155 00
Stationery Department .....	3	2	175 00
The Senate .....	3		130 00
Trade and Commerce .....	3	1	150 00
Labour Department .....	1		35 00
	105	72	6,688 00

## APPENDED TABLES.

The usual tabular statements of the lines and offices, staff, &c., of the telegraph service, following hereupon, will be found to contain whatever additions or changes have been made up to June 30, 1901.

D. H. KEELEY,

*General Superintendent.*

OTTAWA, December 16, 1901.



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GOVERNMENT TELEGRAPH SERVICE.  
NEWFOUNDLAND TELEGRAPH SERVICE.

No.	Stations.	Inter- mediate Distance.	Operator.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Port au Basque.	0		50 00 or commission		N.B. The commission is 25 per cent upon all busi- ness to and from the office; said commission guaranteed not to be less than at the rate of \$50 per annum.
2	Cape Ray Lighthouse.	14		50 00		
Total		14		100 00		

N.B.—The above short line is constructed in connection with the Signal Service, and connects at Port au Basque with the land line system of the Anglo-American Telegraph Company.



GOVERNMENT TELEGRAPH SERVICE (Continued).

ANTICOSTI TELEGRAPH SYSTEM.

No.	Stations.	Inter- mediate Distance.	Agent and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	*Fox Bay.....	0	Geo. Cabot.....	50 00 or commission.	May 13, 1899.	The commission is 25 per cent on all business to and from the office in each instance; and commission guaranteed not to be less than at the rate of \$50 per annum.
2	Heath Point Lighthouse...	23	A. Tremblay.....	50 00	Aug. 1, 1900.	*A special allowance for maintenance of office, \$50 per annum, has been added to the commission for offices marked *, since September, 1887.
3	South Point Lighthouse...	32½	A. Nadeau.....	50 00	Oct. 1, 1888.	
4	*Shalloo Creek.....	17½	B. Bradley.....	50 00	July 7, 1881.	General repairer. Plus \$1 per d. when absent on duty.
5	Salt Lake.....	52½	Z. Beaudin, repairer..	365 00	May 6, 1896.	
6	South-west Pt. Lighthouse.	15	A. Beaudin, operator..	50 00	" 12, 1896.	
7	Jupiter River.....	7	A. Z. Lemieux, operator..	300 00	June 1, 1901	
8	Otter River.....	17½	.....	50 00	.....	Temporarily closed since May, 1899.
9	*Beesee River.....	22	.....	50 00	.....	
10	Cape Eagle (Ellis Bay).....	10	.....	50 00	.....	
11	West Point Lighthouse.	9	A. Malouin, dist. supt.....	200 00 per annum	Aug. 1, 1900	
12	English Bay.....	3	" operator.....	50 00	" 10, 1881.	
....	Mechastie Bay (cable land- ing).....	14½	F. Cabot.....	120 00 and commission.	July 1, 1882.	
	Totals.....	223½		1,485 00		

South-west Point connects with L'Anse à Fougère, Gaspé, by cable 44½ knots; and from Mechastie Bay connection is made with Long Point of Mingan by cable 21 knots.

0	L'Anse à Fougère.....		N. Bernier.....	17 00	.....	Special allowance for the cable terminus. A testing station only.
1	Gaspé Basin.....	28	J. J. Annett.....	420 00	Oct. 16, 1881	Transfer office. Connection with G. N. W. telegraph system.
		28		137 00		



SESSIONAL PAPER No. 19

MAGDALEN ISLANDS SYSTEM.  
MAGDALEN ISLANDS SECTION.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Amherst. . . . .	0	Miss J. Shea	50 00 or com'n.	Oct. 1, 1882	The commission is 25 per cent on all business to and from the office in each instance; said commission guaranteed to be not less than at the rate of \$50 per annum.
2	Amherst Lighthouse	9	Wm. Cormier	50 00 "	June 11, 1881	
3	Etang du Nord village	15	P. Pelletier, hman	400 00	Dec. 1, 1881	Plus \$20 per annum for rent. (F. G. Binnett acting since Dec. 1, 1900.)
4	Etang du Nord lighthouse	1	Mrs. A. Bisset	50 00 "	1, 1881	
5	Grindstone Island.	5	N. Arsenault	50 00	Sept. 1, 1891	Two wire loop line.
			W. Leslie.	Commission 25 p. c	May 29, 1897	
6	Grindstone West.		A. LeBeaudais, D. Spt	600 00	Aug. 17, 1880	Plus \$1 per day when absent on duty.
			Mrs. LeBeaudais, op.	50 00	Sept. 15, 1893	
7	House Harbour (1/2 knot cable)	3	P. L. Jones	50 00 or com'n	June 1, 1888	
8	Wolfe Island	28 1/2				
9	Grosse Isle.	11	N. Clark	200 00 and com'n	June 1, 1888	
10	Grand Entry	11	Mrs. F. Atkins	50 00 or com'n	Feb. 18, 1882	
		83 1/2		1,550 00		

Grosse Isle connects at Old Harry with Meat Cove, C.B., by cable 55 knots.



GOVERNMENT TELEGRAPH SERVICE *Continued.*  
MAGDALEN ISLAND SYSTEM.  
CAPE BRETON SECTION.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Meat Cove (cable station)	0	A. B. McDonald, Circuit Manager.	720 00	Nov. 7, 1880	Salary, \$500 per year previous to Sept. 1, 1901. The commission is 25 p.c. on all business to and from the office in each instance; said commission guaran- teed to be not less than at the rate of \$50 per annum.
2	Aspy Bay	10½	I. Y. Nichols.	50 00 or commission	July 1, 1894	
3	Dingwall (loop line).	3½	Murdock McLeod.	"	Aug. 31, 1898.	The loop line formerly running to White Point, has been withdrawn.
4	Nel's Harbour (half way house loop line).	2½	M. McLeod.	50 00	April 1, 1887.	
5	Ingonish North Bay.	1½	J. M. Burke	50 00	" 1, 1882.	
6	South Ingonish.	9	Geo. Brewer.	50 00	May 7, 1899	
7	French River ½ knot cable.	10½	John McDonald	50 00	April 1, 1889.	
8	Indian Brook.	23	Annie McDonald.	50 00	Aug. 1, 1901	
9	Englishtown ½ knot cable	5	W. Bingham	50 00	July 19, 1882	Switching point for Baddeck line.
10	South Gut, St. Ann's (on loop)	11		120 00		
11	Baddeck (on loop)	5	A. Anderson	50 00		Closed December 31, 1899.
	Englishtown (back on loop)	13		120 00	Dec. 2, 1898.	Guaranteed commin was \$50 prior to March 1, 1900.
12	Kelley's Cove, N. Camp- bellton	18				This loop to Baddeck starts from and returns to Englishtown.
13	Big Bras d'Or ½ knot cable.	6	Miss M. Campbell	50 00 or commission	April 1, 1885.	
14	North Sydney	2½	Mrs. E. Livingston	50 00	Jan. 1, 1889.	
		12½	W. U. Tel. Co.	..... Commisn only		The commission is 50 p.c. on local business and 25 p.c. on through messages; and covers supervision of line and office accommodation at North Sydney.
	<i>Repairers' Section.</i>					
	Meat Cove Sugar Loaf		M. McAkill	80 00 or commission	April 1, 1898	
	Sugar Loaf Ingonish		Charles Smith.	80 00	" 1, 1898	
	Ingonish Englishtown		R. A. McDonald	80 00	" 1, 1898	
	Englishtown Baddeck.		D. Morrison	60 00	" 1, 1898.	
	Englishtown N. Sydney.		J. Campbell	60 00	May 1, 1899	
	Totals	148½		1,820 00		

Meat Cove station connects with the Magdalen Islands system by a cable to Old Harry Head, 5½ knots, and with St. Paul's Island by a cable of 20 knots. The latter is operated with telephones.



SESSIONAL PAPER No. 19

NOVA SCOTIA TELEGRAPH SYSTEM.

CAPE SABLE SECTION.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.  \$ cts	Date of Appointment	Notes.
1	Barrington					
2	Newellton (including 1 knots cable).	0				
3	Cape Sable Island (lights house including 1 mile cable)	11				
	Totals	61				This line has been leased to the Barrington Telephone Company from August 12, 1897. The lease is term- inable at any time.
		174				

EAST COAST SECTION.

N.B. In connection with the Signal Service, a land line, 208 miles in length was erected in 1881, between Chatham and Halifax, for a sum of \$16,000, and is maintained and operated by the Western Union Telegraph Company, without further cost to the Government.



1-2 EDWARD VII., A. 1902

GOVERNMENT TELEGRAPH SERVICE *Continued.*  
MARQUETTECAMP AND MEAT COVE, C.B., TELEGRAPH SYSTEM.

No.	Stations.	Inter- mediate Distance s.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	Madou.	0	Mrs. M. McDonald.	120 00 per annum	April 1, 1887	The commission is 25 p. c. of the Government line
2	Broad Cove.	20	Mrs. Annie McLelland	50 00 or commission	Mar. 1, 1892	tolls, and is guaranteed to amount to not less than
3	Broad Cove Station	34	Accommodation of	25 p.c. without guarantee	July 1, 1901	\$50 per annum. Where 50 p. c. commission is
4	South-west Margaree	81	J. D. McLellan	50 00 or commission	Feb. 1, 1898	paid there is no guarantee as to amount.
5	Margaree Harbor	5	H. K. McLean	50 00	Oct. 20, 1896	
6	North-west Margaree (loop line wire)	10	Mrs. J. D. Ross.	50 00	Feb. 1, 1898	
7	Grand Etang	8	A. Doucet	50 00	Jan. 1, 1900	This office was closed for a year from January, 1899.
8	Chateaup.	8	Mrs. M. Fiset	100 00	" 1, 1887	* At South-west Margaree the commission was 50 p.c till Sept. 1, 1899.
9	Pleasant Bay	27	Mrs. D. Smith	50 00	Apr. 14, 1900	
	Meat Cove	19	(See Meat Cove Line D. C. Dawson, D. Supt	150 00	Jan. 1, 1887	
	Totals	109		\$ 670 00		

CHATHAM ESCUMINAC, N.B., TELEGRAPH SYSTEM.

1	Chatham.	0	Great North-western Tele- graph Co.	185 00.		This amount is paid for supervision of the line and office accommodation at Chatham.
2	Black Brook	54		50 00 or commission		The commission is 25 p. c. of the Government line
3	Bay de Vin.	15	Mrs. M. Williston	50 00	Mar. 1, 1885	tariff receipts in each instance, and is guaranteed
4	Lower Hardwick.	6	Mrs. M. Bummer	50 00	Aug. 1, 1891	to amount to not less than \$50 per annum
5	Escuminac.	31	D. Lewis.	50 00	Sept. 1, 1885	
6	Point Escuminac lighthouse	12	K. R. McLellan	50 00	Nov. 1, 1893	\$42 per annum allowed for care of main battery at Point Escuminac.
	Totals	12		435 00		



## SESSIONAL PAPER No. 19

## GROSSE ISLE QUARANTINE TELEGRAPH SYSTEM

No.	Stations.	Inter- mediate Distances	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
1	Quebec	Miles. 0	Great Northwestern Tele- graph Co.	185 00		This amount is paid for supervision of the line, and covers rent of pole line from Quebec to L'Ange-Gardien, for which \$85 per annum is charged.
2	L'Ange-Gardien.	13				
3	Orléans Island (cable).	4½	C. Thibault	50 00 or commission	Mar. 1, 1885	This commission is 25 p. c. of the Government line tariff in each instance, and guaranteed to amount to not less than \$50 per annum.
4	St. Pierre	3½	M. Plante	50 00 "	April 7, 1896	
5	St. Pierre	6½	M. Gobeil	120 00 and 25 p. c. commission	Sept. 15, 1888	
6	St. Jean	7	P. Pouliot	120 00 and 25 p. c. commission	July 1, 1888	
7	St. François	6½	O. Lemelin	50 00 or commission	July 15, 1900	
8	Isle-à-Réaux (including 2 knots cable).	3½				
9	Isle-à-Réaux (land line)	2½				
10	Grosse Isle quarantine office (including 2 knots cable).	3½	M. D. Masson	50 00 "	May 1, 1901	\$12 per annum allowed for care of main battery at Grosse Isle.
11	Quarantine telephone system 2 wire line.	1½				Note: The telephone system on Grosse Isle since May 1893, has comprised 1½ miles of 2 wire line with 11 connections or stations.
		52½		625 00		



1-2 EDWARD VII., A. 1902

GOVERNMENT TELEGRAPH SERVICE—Continued.  
BAY OF FUNDY, N.B., TELEGRAPH SYSTEM.

GRAND MANAN SECTION.

No.	Stations.	Inter- mediate Distance.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Memo.
	<i>Long Eddy Cable Hat to</i>	Miles.		\$ cts.		
1	Flagg's Cove	3	Mrs. C. C. Seely (D. Supt.) Miss M. E. Barnham. A. Gillmore, repairer.	540 00 50 00 or commission 60 00	Nov. 18, 1880 Oct. 1, 1898 Dec. 1, 1894	*The commission is 25 p.c. on all business to and from the office in each instance; said commission guaranteed not to be less than at the rate of \$50 per annum. When 50 p.c. commission is paid there is no guarantee as to amount.
2	Castalia	24	G. E. Dalzell.	Commission 25 p.c.	June 1, 1898	
3	Woodward's Cove.	24	W. A. Fraser.	" 50 "	Feb. 28, 1893	
4	Grand Harbour	2	J. L. Newton	75 00 or commission	April 1, 1887	\$25 per annum is included for repeating Whitehead branch.
5	Seal Cove	44	J. Ingersoll	50 00 "	Sept. 22, 1899	
6	Southern Head Lighthouse	54	O. McLaughlin.	Commission 25 p.c	April 24, 1897	Southern Head office is now operated by telephone from Seal Cove.
	<i>Branch Line.</i>					
7	Grand Harbour.	0				
8	Cheney's Island (cable)	47	W. Cheney.	Commission 25 p.c	Feb. 1, 1891	
	Whitehead Island (cable)	13	I. D. Harvey	50 00 or commission	June 1, 1898	
	Totals.	274		825 00		

CAMPBELL SECTION.

	<i>Liberty Cove Cable Hat to</i>					
1	Welchpool	74	Miss E. C. Vennell	210 00 and commission	Sept. 1, 1895	
2	Eastport, Maine, U.S.A.	1	J. Cushing	200 00	Dec. 26, 1881	
	Totals	8		410 00		

A cable of 1½ knots connects Welchpool with the landing ½ mile from Eastport; and a cable of 7½ knots is laid from Long Eddy, Grand Manan, to Liberty Cove, Campbell.



NOTES BY THE EDITOR

No.	Stations.	Inter- mediate Distance.	Agent and Operators.	Salary per Annum.	Date of Appointment.	Notes.
1	Bay St. Paul		F. Roehm.	\$80.00 per annum.		
2	St. Urban	9	A. Roehm.	50.00 or commission.	Apr. 1, 1895.	The commission on steam is 25 per cent of the gross revenue of the line; the amount paid is covered by the tolls of the line; the amount paid is not less than \$50 per annum.
3	La Crosse	27	Alfred G. Fisher.	50.00.	Dec. 1, 1895.	
4	St. Alexis	31	A. Gauthier operator.	250.00.	May 1, 1895.	
5	St. Alphonse de Beatoeville.	3	Mrs. D. Simard.	50.00 or commission.	Nov. 1, 1895.	
6	Cherbourg	3	A. Simard.	50.00.	April 1, 1895.	
		11	C. W. Tel. Co.	25 per cent on	Nov. 1, 1895.	
		1	J. Roehm operator.	420.00 per annum.	June 1, 1897.	Placed 25 per annum for care of main battery
	Bellevue, St. Alexis.					1 cent on sales on the branch line to La Anse
	La Anse St. Jean	43	Mr. R. Meade.	50.00 or commission.	Apr. 1, 1897.	Placed 25 per annum for care of main battery
	Totals	132		1,000.00		



1-2 EDWARD VII., A. 1902

GOVERNMENT TELEGRAPH SERVICE *Continued.*  
CHICOUTIMI AND NORTH OF ST. LAWRENCE TELEGRAPH SYSTEM *Continued.*  
North Shore (West of Lersimis).

No.	Stations.	Inter-mediate Distance.	Agents and Operators.	Salaries per annum.	Date of Appointment.	Memo.
				\$ cts.		
1	Murray Bay.	0	Mrs. F. Vincent.	50 00 or comm'n	Previous to April 1, 1885	
2	Cap à l'Aigle.	4	N. Duchesne.	50 00 "	June 1, 1888	
3	St. Fidele.	6	A. N. Parent.	50 00 "	April 1, 1890	
4	Port au Port.	7	(A. Brassard (repaired).	50 00 "	May 1, 1889	
5	St. Simon.	4	(A. Brassard (repaired).	210 00 "	June 1, 1897	
6	Baie des Rochers.	12	D. Gaudin.	50 00 "	Dec. 1, 1887	
7	Rivière du.	17	G. Savard.	50 00 "	June 1, 1887	
8	St. Etienne.	13	(G. Boullenne.	100 00 "	Nov. 1, 1886	Mr. Boullenne at River Canard has acted as repeating operator for the St. Etienne branch since August, 1889.
9	Tadoussac (1) knot cable.	13	(E. Boullenne (repaired).	210 00 "	Sept. 1, 1899	
10	Sault au Cochon (1) knot cable.	13	J. E. Caron.	50 00 or comm'n	Nov. 1, 1888	
11	Port au Port.	12	E. Maltus.	50 00 "	Dec. 6, 1901	
12	Port au Port.	12	M. Savard.	50 00 "	April 1, 1885	
13	Port au Port.	12	J. H. Topping.	50 00 "	" " 1885	
14	Port au Port.	8	P. Boucard.	50 00 or comm'n	May 6, 1892	Commission, at 25 per cent, without guarantee at Baie des Bacons.
15	Port au Port.	8	J. A. Pese.	50 00 or comm'n	April 1, 1885	Closed November, 1895.
16	Port au Port.	6	(S. Bouchard.	50 00 or comm'n	July 1, 1890	
17	Port au Port.	7	(E. Cochon (repaired).	120 00 "	April 1, 1888	
18	Port au Port.	31	(A. Lavoisier (repaired, and op.).	50 00 or comm'n	Sept. 1, 1896	Sault au Cochon closed September 30, 1896.
			(E. Lavoisier (repaired, and op.).	180 00 "	" " 1896	
			E. Pope, dist. supt.	600 00 "	April 1, 1885	
	Totals.	174		2,870 00		

Note.—In the estimates the maintenance of the Chicoutimi and North Shore lines is provided under head of North Shore Line. They are operated conjointly.



SESSIONAL PAPER No. 19

CHICOUTIMI AND NORTH OF ST. LAWRENCE TELEGRAPH SYSTEM *Continued.* North Shore (East of Bersimis).

No.	Stations	Inter- mediate Distance.	Agents and Operators	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
1	P'te aux Outardes cable	12	H. Tremblay	50 00 on commission	Dec. 1, 1896	
2	P'te Parades—Mamoungan cable landing.	18				(The repeating office formerly at Mamoungan was removed to Bersimis in September, 1896.
3	Secongalls, Mds 14 mile loop line from Pt. Parades	28	Accommodation office.	25 per cent commission	Aug. 1, 1901	
4	River Godbout cable	26	N. A. Cormier	50 00 on commission	Oct. 15, 1885	
5	Pointe des Monts	18 1/2	L. P. Palfard	50 00	Dec. 28, 1883	
6	Trinity Bay West	2 1/2	Z. Poulard	50 00	May 16, 1884	
7	Trinity Bay East	2 1/2	A. Pélouze	Commission only	" 1, 1889	
8	Caribou Islands	7	I. Cormier	"	Sept. 1, 1889	
9	Pointe aux Anglais	10	Paul Gato	Accommodation office	Jan. 10, 1895	No commission is paid at this office.
10	Pontecost River	6 1/2	E. H. Trott, D. Supt	1,080 00 per annum.	Nov. 1, 1891	
11	St. Marguerite	47	A. Theriault	180 00	July 1, 1888	
12	Seven Islands	99	P. E. Vignault, opr.	180 00	Jan. 2, 1884	
13	River Moose	15 1/2	P. Gauthier, fireman	540 00	April 22, 1890	Plus 50 cents per day when absent on duty.
14	Little River	57	J. Poirer	50 00 on commission	June 1, 1896	
15	Scheld Lake	13	Miss H. Leberge	50 00	Oct. 10, 1900	
16	Thunder River	6 1/2	A. LeBerge	50 00	" 1, 1897	
17	Magpie	14	Mrs. H. Chy	50 00	Feb. 1, 1890	
18	St. John's River	9	Geo. Malloy	50 00	Oct. 1, 1889	
19	Long Point	10	B. Chambers	50 00	" 1, 1889	
20	Mingan	7	A. Maloney	360 00	Sept. 21, 1896	Long Point is the repeating office for the Anticosti cable in operation since Sept. 1, 1891.
21	Pointe aux Esquimaux	24	M. J. Maloney	50 00 on commission	Oct. 1, 1889	
22	Pastie Bay	43	D. C. Hall	Commission only	May 21, 1896	The commission at Point aux Esquimaux is 50 per cent, without guarantee as to amount.
23	Aguamus	36 1/2	S. Tanguay	50 00 on commission	Sept. 1, 1897	
24	Natushequan	16	L. Chabannes	100 00	Oct. 2, 1897	
25	Kogaska	33	E. Vignault	50 00	Sept. 16, 1898	
26	Big Renard	43	A. Cormier	120 00 per annum.	Jan. 1, 1899	
27	Pointe du Mercier	48	Miss R. A. Bliss	50 00 on commission	Sept. 21, 1898	
28	Harrington	20	J. Gaudet	50 00	July 19, 1900	
29	Quebec Meadows	57	Mrs. John Jones	125 00	Jan. 10, 1901	
30	St. Augustine	54	A. Cormier (teacher)	300 00	Sept. 15, 1900	
31	Point Esprit—St Paul's River	72	W. Burgess	"	June 1, 1901	
32	Blanc Sablon	30	M. Chevalier	"	July 1, 1901	
33	Red Bay	54	Thos. Morel	"	" 1, 1901	
34	Chateau Bay	35	Wm. Monte	300 00	" 1, 1901	
35	Belle Isle cable 22 1/2 land line 1 1/2	23 1/2	Jos. Maloney	300 00	June 8, 1901	
			J. O'Sullivan, spl. act	300 00	Sept. 14, 1901	
			J. T. Colton, opr.	180 00	" 14, 1901	
Totals				4,515 00		

NOTE.—The commission, except where otherwise stated, is 25 per cent of the Government line tolls on business handled. The Belle Isle cable 22 1/2 knots connects with the office at Chateau Bay by a 3 mile of land line and with the lighthouse at Belle Isle by 4 mile land line.



1-2 EDWARD VII., A. 1902

GOVERNMENT TELEGRAPH SERVICE—Continued  
ONTARIO—PELLE ISLAND TELEGRAPH SERVICE.

No.	Stations.	Inter- mediate Stations.	Agents and Operators.	Salaries per Annum.	Date of Appointment.	Notes.
				\$	cts.	
1	Leamington		J. McL. Salkirk, D. Suplt.	50 00	Nov. 1, 1888	
2	Leamington Dock.		E. Deslauriers	Accommodation office.	" 1, 1895	
3	Club House.		C. Harrison.	Commission 25 p.c.	April 1, 1889	The commission is on the tolls for the Government
4	Point Pelé		W. A. Grubb.		Nov. 1, 1888	line.
	Leamington Dock to North Point, cable.					The cable formerly 9½ knots from Point Pelé to the
5	North Point Lighthouse		J. R. Godwell.	Commission 25 p.c.	June 1, 1899	Island is now laid as here indicated 17 knots. The
6	North Dock		C. B. Quirk		Nov. 1, 1888	change was effected in August, 1901.
7	McIntyre's Corners.		Miss A. McIntyre		" 1, 1896	
8	West Dock		A. M. McCordick		" 9, 1888	
9	South Dock.		T. W. Peterson.		July 1, 1900	
	Totals			50 00		

Note.—This line is operated with telephones.



## SESSIONAL PAPER No. 19

## LINES IN THE NORTH WEST TERRITORIES.

No.	Stations.	Inter- mediate Distance.	Agents.	Saleses per Annum.	Date of Appointment.	Remarks.
<i>Qu'Appelle, Edmonton Section</i>						
1	Qu'Appelle	0	J. S. Macdonald, D. Sup.	1,200 00	1, 1898	
2	Fort Qu'Appelle		C. P. R. Tel. Co.	420 00	1, 1896	The agent operator at Qu'Appelle is joint with the C.P.R.
3	Tonawood	17	H. J. Macdonald, lineman	360 00	1, 1899	
4	Humboldt	46	Miss E. Johnston,	600 00	March 1, 1885	
		75	A. von Jandelson, ch.	600 00	1, 1883	
5	Saskatoon (14 miles loop)	69	C. P. R. Tel. Co.	300 00	1, 1892	Humboldt office was closed August 20, 1893. The agent operator at Saskatoon is joint with the C.P.R.
6	Hemlock	52	J. Harrington, repairer	600 00	1, 1888	
7	Patleford	47	W. Salisbury	720 00	Oct. 1, 1886	
		47	L. P. G. Noul	720 00	April 1, 1890	
8	Biesville	27	J. T. Gledhill, lineman	720 00	Dec. 1, 1900	
9	Pitt	62	D. Noul	600 00	Oct. 1, 1900	
10	Onion Lake.	13	H. Macdonald, ch.	600 00	Oct. 1, 1900	Closed since October 1898. Lineman thereafter stationed at Onion Lake.
11	Moose	32	J. W. Carroll	600 00	Sept. 1, 1900	
12	St. Paul de Matis	32	M. Thelen	300 00	Dec. 1, 1899	
13	Saddle Lake	13	L. Picard	600 00	July 1, 1891	A telephone line extends from the office at Saddle Lake to the Industrial School, 6 1/2 miles.
14	Victoria	37	J. C. Gordon	600 00	April 1, 1899	
15	Stat	6	F. A. Holmes	50 p. c. commission	May 28, 1901	
16	Fort Saskatchewan	43	A. W. M. Campbell	600 00	Oct. 1, 1898	Spec. connection for Mounted Police.
17	Edmonton	24	J. A. Maclelland	120 00	May 1, 1899	The office at Edmonton has been operated jointly with the C.P.R. Tel. Co. since Jan. 1, 1892.
	Branch Line Edmonton St. Albert	0	S. B. McNairna	360 00	June 1, 1899	
		0	W. McKay, repairer	720 00	May 1, 1896	The St. Albert branch line is operated with telephones. It was leased to the Edmonton District Telephone Co. from October 24, 1895.
<i>Wood Mountain Section</i>						
1	Moose Jaw	0	A. Wilcox, agent	240 00	Dec. 1, 1891	Moose Jaw office is operated jointly with the Canadian Pacific Telegraph Co.
2	Wood Mountain	90	H. Sikors, repairer	600 00	1, 1893	
			J. H. Thompson, agent	300 00	1, 1890	
	Total	698		12,540 00		



GOVERNMENT TELEGRAPH SERVICE—Continued.

GOVERNMENT TELEGRAPH SERVICE IN BRITISH COLUMBIA.

No.	Stations	Inter- mediate Distances	Agents	Salaries per Annum.	Date of Appointment.	Memo.
		Miles.		\$ cts.		
	<i>Ashcroft Barkerville</i>					
1	Ashcroft Station	0	J. Wilson (Vancouver), joint Dist. Supt. Govt. & C.P. lines	186 00		Proportion of salary pertaining to this line.
2	Clinton	30	C. A. Sheer	240 00	July 4, 1898	Proportion of salary pertaining to this line. The Ashcroft
3	Bridge Creek (115 Mile House)	53	A. LeBourdais, agt. and rep.	600 00	Feb. 16, 1883	office is operated jointly with the C.P.R. Telegraph.
4	150 Mile House	40	J. P. McIntosh	720 00	Jan. 1, 1900	closed June 1901 and transferred temporarily to 108 Mile House.
5	Soda Creek	38	S. T. Hall, agt. and oper.	456 00	Nov. 1, 1896	The testing office formerly at 134-Mile House was discon-
6	Quenah	54	G. H. Smith, agt. and rep.	900 00	March 1, 1896	tained in May, 1900.
7	Stanley	48	J. E. Bowton	564 00	Prior to 1891	
8	Barkerville	13	Accommodation comm. office.	1,000 00	Feb. 17, 1873	
	Total	276	J. Stone, agent and repairer.	4,660 00		
	<i>Ashcroft Lillooet</i>					
	Ashcroft Station	0	J. Wilson (Vancouver), joint Dist. Supt. Govt. & C.P. lines	120 00		Proportion of salary pertaining to this line.
1	Pavillion	40	C. A. Sheer	240 00	July 4, 1898	Proportion of salary pertaining to this line. The Ashcroft
2	Lillooet	22	Accommodation comm. office.		Dec. 1, 1896	office is operated jointly with the C.P.R. Telegraph.
	Total	62	S. A. Macfarlane, agt. and op.	720 00	Jan. 3, 1896	
				1,080 00		



SESSIONAL PAPER No. 19

BRITISH COLUMBIA—Continued.

No.	Stations.	Inter- mediate Distance.	Agents.	Salaries per Annum.	Date of Appointment.	Memo.
<i>Victoria—Cape Beale</i>						
1	Victoria.	0	Jas. Wilson (Kamloops) joint Dist. Supt. Govt. and C. P. lines.	\$ cts.		
2	Sooke.	18	E. Houghton, operator	120 00	Nov. 1, 1891	Proportion of salary pertaining to this line. Proportion of salary.
3	Otter Point.	8	M. Milne, com. office.	240 00	April 21, 1896	
4	Jordan River.	10	B. Gordon, agt. and operator	720 00	Dec. 1, 1891	
5	Port San Juan.	30	J. Gionche	540 00	May 1, 1897	
			B. H. Kirkpatrick	720 00	July 1, 1900	
6	Cannanah Light-house, (Cape Horn 2 miles west)	24	W. P. Davkin	240 00	Nov. 1, 1891	These three lines are operated by the Canadian Pacific Rail- way Co. for the Government, the arrangement being terminable at any time.
			D. Logan, repairer	540 00	April 1, 1898	
			Otto Rosander, repairer.	540 00	Mar. 6, 1901	
7	Cape Beale	28	M. Patterson, agt. and oper.	120 00	Sept. 1, 1899	
Total				3,780 00		

No.	Offices	Inter- mediate Distance.	Agents, &c.	Positions.	Salaries per Annum.	Date of Appointment.	Memo.
<i>Kamloops—Lower Nicola</i>							
1	Kamloops	0	A. J. Venn (C. P. Tel.)	Agent	300 00	April 18, 1900	The allowance was but \$180 per annum prior to March 1, 1901.
2	Quilchena	54	E. O. Roncke	Lessee.	25 p.c. Com.	May 1, 1900	Note.—This line is operated with telephones. The lessees pay a monthly rent for the connections, and are allowed 25 per cent commission on local tolls for messages and conversations of non-subscribers.
3	Nicola Lake		A. R. Cunningham	"	"	"	
4	"		A. B. House	"	"	"	
5	Lower Nicola	13	Geo. Armstrong.	"	"	"	
Total		67					

This line is operated under the superintendence of the Resident Engineer at Victoria.



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GOVERNMENT TELEGRAPH SERVICE - Continued  
BRITISH COLONIAL - Continued.

No.	Office.	Inter- mediate Distance.	Agent, &c.	Positions.	Salary per Annum.	Date of Appointment	Remarks.
Natalia Column.							
1	Namunee.	0	W. F. Archibald, Agent with C.P.R.	Agent and operator.	300 00	Mar. 1, 1896	Payment was \$186 per annum prior to May 1, 1901 The amount comprises \$20 per month for agency and operation, \$3 for messenger service and \$2 50 for battery care.
2	Wellington.	5	E. A. N. Ry. Co.,	Commissioner.		April 1, 1893	
3	Parksville.	23	Mrs. R. Williams		240 00	Dec. 1, 1897	
4	Fanny Bay.	23	Geo. Williams.	Reporter.	570 00	1, 1897	
5	Union Bay.	94	Thos. Hudson.	"	780 00	Nov. 17, 1898	
6	Union Mines	10	E. McDonald	Agent and operator.	360 00	June 3, 1898	
7	Cambairland	7	J. Dunsdon	Accommodation officer.			See mention of this in body of report (1897-98).
8	Courtney.	34	Albert Peacy	Agent and operator	120 00		
9	Cornoy.	51	M. McDonald	Agent and operator	and com. 25 p c 360 00 and com. 25 p c	April 28, 1898 Nov. 1, 1895	Courtney and Fanny Bay are communicated with by telephone at pre-arranged intervals.
Total							
Parksville Cape Beale.							
1	Parksville	0	See above				
2	Albion	29	C. T. Haslam.	Agent and operator	720 00	June 27, 1895	Note. The repairing of this Albion Cape Beale line necessitates the use of a steamboat, and has been contracted for with Mr. G. A. Huff at \$75 per month covering all charges. Proportion of salary pertaining to this line.
3	Albion.	57	P. A. Haslam.	Assistant and operator	120 00	Oct. 1, 1899	
4	Cape Beale	57	G. A. Huff	Comp. reporter	900 00	May 1, 1900	
5	Total	80	M. Patterson.	Agent and operator.	240 00	May 1, 1900	

The above lines are operated by the Government through the office of the Resident Engineer at Victoria.



BENNETT DAWSON—ATLIN.

No.	Stations.	Inter- mediate Distance.	Agents.	Salaries per Annum.	Date of Appointment.	Mem.
1	Bennett	0	M. W. Crean, Dist. Supt.	\$165 66 per month.	April --, 1899	
			E. W. Dowling, operator	125 00 " "	" 1, 1900.	
			N. Bellefleur, head lineman.	150 00 " "	Sept. 29, 1899.	
			H. Gagne, lineman	3 00 " day.	Oct. 1, 1899.	
28	Cariboo Crossing		E. M. Stikley, operator	100 00 " month	Sept. 28, 1899.	
18	Tagish.		R. M. Grimes " " " "	" "	" 28, 1899.	
			E. S. Chambers, lineman	\$ 3 00 per day.	Oct. 1, 1899	
			Ignace Hebert	3 00 " "	Nov. 1, 1899.	
4	Miles Canyon	0				
5	White Horse	5	G. S. Flemming, operator....	\$125 00 per month	Sept. 28, 1899.	
			F. Dixon, lineman..	3 00 " day.	Oct. 1, 1899.	
6	Lower Laberge	29	T. Phalen, operator..	100 00 " month	Sept. 28, 1899	
			J. H. Brown, lineman...	3 00 " day.	Oct. 1, 1899.	
7	Hootalinqua	30	F. R. Walker, operator	100 00 " month	Sept. 28, 1899.	
8	Big Salmon	34	G. A. McLachlan, operator	100 00 " "	" 28, 1899	
			J. C. Kirk, linemen	3 00 " day.	Oct. 1, 1899	
9	Five Fingers....	96	W. R. Holden, operator ..	100 00 " month	Sept. 28, 1899.	
			H. Savageau, lineman ..	3 00 " day.		
10	Fort Selkirk.....	58	G. Hutchinsan, operator...	110 00 " month.	Sept. 28, 1899.	
			H. D. Card, lineman ..	3 00 " day.	Oct. 1, 1899.	
11	Selwyn.	30	J. Brownlow, operator ..	100 00 " month	" 1, 1899.	
			R. C. McDonald, lineman..	3 00 " day.	" 1, 1899.	
12	Stewart River .....	75	W. A. Moore, operator ..	100 00 " month	Dec. 18, 1899	
			E. E. Mollat, lineman ..	3 00 " day.	Feb. 19, 1900	

Summer office closed Nov. 13, 1899.



GOVERNMENT TELEGRAPH SERVICE *Continued.*  
BENNETT DAWSON ATLIN LINE *Continued.*

No.	Stations.	Inter- mediate Distance.	Agents.	Salaries per Annum.	Date of Appointment.	Memo.
				\$ cts.		
13	Ogilvie.	23	J. W. Wilkinson, operator. Archie Johnson, lineman	100 00 per month 3 00 " day	Sept. 28, 1899. Dec. 7, 1899	
14	Dawson	48	A. B. Clegg, manager. D. S. McKenzie, operator. Percy Overton, mess, &c. C. A. Gouture, head lineman. W. A. McNamara, lineman.	125 00 " month. 125 00 " " 90 00 " " 150 00 " " 100 00 " "	Sept. 10, 1899 " 18, 1899 Nov. 17, 1899 Sept. 28, 1899 Oct. 1, 1899	
		564				
	<i>Branch.</i>					
15	Tagish Atlin	75	A. H. Mansfield, operator J. Huston, lineman E. Mulligan	125 00 " " 3 50 " day 3 50 " "	" 1, 1899 " 1, 1899 " 1, 1899	
		639		42,400 00		
	<i>Later Construction.</i>					
	Dawson to Boundary ..	905				
	Hazelton to Fort Simpson ..	198				
	Quesnelle to Atlin ..	885½				
	Ashcroft to Quesnelle ..	215½				
	Total ..	2,029½				

These lines have been under construction in the course of 1901 and will be tabulated in the next annual report.



GOVERNMENT TELEGRAPH LINES.

SPECIAL TARIFF.

*Cable messages.*—Rates for cable messages and for press reports, passing over the Yukon line will be found in connection with other British Columbia lines in the following pages.

Elsewhere, the rate for transatlantic messages passing over the government lines is the same as for ordinary through messages, excepting where the ordinary tariff is more than 25 cents; in such cases the government line rate is 4 cents per word, with a minimum charge of 25 cents. For example:—

For a message of six words or less the charge is 25 cents for government line.

For a message of seven words the charge is (7 x 4c.) 28 cents for government line.

For a message of twelve words the charge is (12 x 4c.) 48 cents for government lines.

In every case the counting of words includes the address and signature in the same way as for transatlantic cable tolls.

*Press despatches.*—The rate for press despatches on the government lines (excepting the Yukon line), formerly a quarter cent per word, has been changed to 20 cent per 100 words; no single message less than 20 cents.

REGULAR TARIFF.

NOVA SCOTIA.

*Line from North Sydney to Meat Cove and Mabou*—Local rate 25-1 \* (13 offices).

Big Bras d'Or.....	Through rate 15-1 from North Sydney, W. U. office.		
New Campbellton's (Kelly's	"	"	"
Cove).....	"	"	"
Port Bevis.. .. .	"	"	"
Englishtown .. . . .	"	"	"
Baddeck.....	"	"	"
St. Anne, South Gut .. . . .	"	"	"
French River .. . . .	"	"	"
South Ingonish .. . . .	"	"	"
Ingonish .. . . .	"	"	"
Neil's Harbour .. . . .	"	"	"
Dingwall .. . . .	"	"	"
Aspy Bay .. . . .	"	"	"
Meat Cove .. . . .	"	"	"
Pleasant Bay .. . . .	"	"	"
Cheticamp .. . . .	"	"	"
Grand Etang .. . . .	"	"	"
North East Margaree .. . . .	"	"	"
Margaree Harbour .. . . .	"	"	"
South West Margaree.....	"	"	"
Broad Cove .. . . .	"	"	"

*Night messages* are exchanged with the Western Union Telegraph Company for offices on this line. Rate 1 cent per word with minimum of 15 cents. The local night rate is 1 cent per word with minimum of 25 cents.



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*Line from Barrington to Cape Sable—Local rate 12-1 (2 offices).*

Newellton.....	Through rate 12-1 from Barrington, W. U. office.
Cape Sable lighthouse .....	“ “ “

This line is now operated by the local telephone company. Terms of lease provide for former telegraph rate as above not being exceeded.

NEW BRUNSWICK.

*Line from Chatham to Point Escuminac—Local rate 25-1 (4 offices).*

Bay du Vin .....	Through rate 15-1 from Chatham, G. N. W. office.
Lower Hardwicke .....	“ “ “
Escuminac .....	“ “ “
Pt. Escuminac Lt. House..	“ “ “

*Line from Eastport, Me., to Campobello, Grand Manan, and Whithead Islands (9 offices)—Local rates between offices on Grand Manan, and Whitehead Islands 15-1; Grand Manan and Campobello Island 25-2; The Islands and Eastport, Me. 25-2. W. U. O.*

Welchpool, Campbello.....	Through rate 25-2 from Eastport, Me., W. U. office.
Flaggs Cove, Grand Manan..	“ “ “
Castallia .....	“ “ “
Woodward's Cove .....	“ “ “
Grand Harbour .....	“ “ “
Seal Cove .....	“ “ “
Southern Head .....	“ “ “
Cheney's Head .....	“ “ “
Whitehead Islands .....	“ “ “

QUEBEC.

*Line from Gaspé to Anticosti Island, Q. (9 offices)—Local rates between offices on the Island 25-1; Gaspé and the Island offices 50-2.*

South West Point .....	Through rate 50-2 from Gaspé G. N. W. office.
Salt Lake .....	“ “ “
Shallop Creek.....	“ “ “
South Point .....	“ “ “
Heath Point .....	“ “ “
Fox Bay .....	“ “ “
Becscie River .....	“ “ “
West Point .....	“ “ “
English Bay .....	“ “ “

*Line from Meat Cove, C. B., N. S., to Magdalen Islands, Q. (8 offices) Local rates between offices on the Island 25-1; Meat Cove and the Islands 50-2; offices on the Meat Cove line and the Islands 50-2.*

Amherst Island .....	Through rate 50-2 from North Sydney, W. U. office.
Amherst Lt. House .....	“ “ “
Etang du Nord Village .....	“ “ “
Etang du Nord Lt. House..	“ “ “
Cap aux Meules (Grindstone)	“ “ “
House Harbour .....	“ “ “
Grosse Isle .....	“ “ “
Grand Entry .....	“ “ “

\* N.B.—When the tariff rate is entered as 25-1 or 50-2, &c., the meaning is that the rate is 25 cents or 50 cents for ten words and 1 cent or 2 cents for each additional word.



## SESSIONAL PAPER No. 19

*Line from Meat Cove C.B., N.S., to St. Paul's Island—Local rate between offices on Meat Cove line and St. Paul's 50-2 (1 office).*

St. Paul's Island Lt. House 50-2 from North Sydney, N.S., W. U. office.

*Line from Quebec to Grosse Isle Quarantine Station (7 offices)—Local rates between offices on Orleans Island and Isle Réaux 15-1; on Orleans Island, Isle Réaux and Quebec 15-1; on Orleans Island and Grosse Isle 25-1; on Isle Réaux and Grosse Isle 15-1.*

St. Pierre, Orléans Island ..	Through rate 15-1	from	Quebec, G. N. W. office
Ste. Pétronille .....	"	"	"
St. Laurent.....	"	"	"
St. Jean .....	"	"	"
St. François .....	"	"	"
Isle Réaux .....	"	"	"
Grosse Isle .....	" 25-1	"	"

*Line from Baie St. Paul to Chicoutimi (6 offices).*

For business with offices west of Baie St. Paul, and terminating at Quebec, add 15c. and 1 c. to the government line tariff.

For business with offices west of Baie St. Paul, beyond Quebec, add the full rate of the Great North-Western Telegraph Company to the government line tariff.

*Line from Murray Bay to Chateau Bay (48 offices) with branch to Anticosti and extension to Belle Isle.*

For business with offices west of Murray Bay and terminating at Quebec, add 15c. and 1c. to the government line tariff.

For business with offices west of Murray Bay beyond Quebec, add the full rate of the Great North-Western Telegraph Company to the government line tariff.

*Local rates between offices not more than 100 miles apart 15-1; more than 100 miles apart 25-1; on mainland and Anticosti 50-2; and on mainland and Belle Isle 50-2.*

St Urbain .....	15-1 from	Baie St. Paul (Ck. Que.)	G. N. W. office.
Lacruche .....	"	"	"
St. Alexis .....	"	"	"
L'Anse St. Jean .....	"	"	"
St. Alphonse de Bagotville..	"	"	"
Chicoutimi .....	"	"	"
Cap à l'Aigle .....	15-1 from	Murray Bay (Ck. Que.)	G. N. W. office.
Ste. Fidèle .....	"	"	"
Port au Persil .....	"	"	"
St. Siméon .....	"	"	"
Baie des Rochers .....	"	"	"
Rivière aux Canards .....	"	"	"
St. Etienne .....	"	"	"
Tadousac.....	"	"	"
Bergeronnes.....	"	"	"
Escoumains .....	"	"	"
Baie des Bacons .....	"	"	"
Mille Vaches .....	"	"	"
Portneuf Mills.....	"	"	"
Portneuf Light .....	"	"	"
Sault au Cochon .....	"	"	"
Betsiamis (Bersimis) .....	"	"	"
Manicouagan (Pt. Outardes)	"	"	"
River Godbout.....	"	"	"
Pointe des Monts .....	"	"	"



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Trinity Bay, West .....	15-1 from Murray Bay (Ck. Que.)	G. N. W. office.
Trinity Bay, East .....	"	"
Caribou Islands .....	"	"
English Point .....	"	"
Pentecost .....	"	"
Ste. Marguerite .....	"	"
Seven Islands .....	"	"
River Moisie .....	"	"
Little River .....	"	"
Sheldrake .....	"	"
Thunder River .....	"	"
Magpie .....	"	"
St. John River.....	"	"
Long Point .....	"	"
Mingan .....	"	"
Point Esquimaux .....	"	"
Piastre Bay.....	"	"
Aguanus .....	"	"
Natashquan .....	"	"
Big Romaine .....	"	"
Pointe du Maurier .....	"	"
Harrington .....	"	"
Baie des Moutons .....	"	"
St. Augustin .....	"	"
Bonne Espérance (St. Paul's River)	"	"
Blanc Sablon .....	"	"
Red Bay .....	"	"
Chateau Bay .....	"	"
Belle Isle .....	50-2	"
Anticosti Id. via Long Point	"	"

ONTARIO.

*Line from Leamington to Pelee Island (Telephone Circuit)—Local rates between Leamington and Point Pelee 15-1; mainland and Island Offices 25-1; Offices on the Island 15-1 (8 offices).*

Gun Club House, mainland..	15-1 (thro' business) from Leamington,	G. N. W.
Pointe Pelee, mainland .....	"	"
Leamington Dock .....	"	"
North Pt. Lt. H'se Pelee Island	"	"
North Dock, Pelee Island .....	"	"
McIntyre's Corners .....	"	"
West Dock, Pelee Island .....	"	"
South Dock .....	"	"

NORTH-WEST TERRITORIES.

*Line from Qu'Appelle (C. P. R. Sta.) to Edmonton, Alberta—Local rates, 15-1, 25-2 50-8 for distances 10 to 600 miles, (13 offices).*

Fort Qu'Appelle..	25-2 Qu'Appelle or Saskatoon.
Touchwood .....	"
Saskatoon (Ts. office C.P.R.	"
Id. .....	"
Henrietta .....	"
Battleford .....	"
Bressaylor .....	25-2 Saskatoon ; 50-3 Qu'Appelle or Edmonton.
Onion Lake .....	"
M .....	"



## SESSIONAL PAPER No. 19

St. Paul de Métis . . . . .	50-3	Saskatoon,	Qu'Appelle or Edmonton.
Saddle Lake . . . . .		"	"
Victoria . . . . .	25-2	Edmonton ;	50-3 Qu'Appelle or Saskatoon.
Fort Saskatchewan . . . . .		"	"
Edmonton (Transfer office			"
C.P.R. Tel.) . . . . .		"	"

*Line from Moosejaw (C. P. R. Stn.) to Wood Mountain—Local rates 25-2 (1 office).*

Wood Mountain . . . . .	25-2	from Moosejaw.
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## BRITISH COLUMBIA.

*Line from Victoria to Cape Beale—Local rate 50-3 (6 offices).*

Sooke . . . . .	50-3	from Victoria C. P. R. Tel. office.
Otter Point . . . . .		" "
Jordan River . . . . .		" "
Port San Juan . . . . .		" "
Carmaanah Lt. House . . . . .		" "
Cape Beale . . . . .		" "

*Line from Nanaimo to Comox—Local rate 25-2 (9 offices).*

Wellington ( C.P.R. & E. & N.Ry.) . .	25-2	from Nanaimo.
Parksville . . . . .		" or Wellington.
Fanny Bay . . . . .		" "
Cumberland . . . . .		" "
Union Bay . . . . .		" "
Union Mines . . . . .		" "
Courtney . . . . .		" "
Comox . . . . .		" "
Alberni (branch) . . . . .		" "

*Line from Alberni to Cape Beale—Local rate 50-3.*

Between offices on the Victoria-Cape Beale line and the Nanaimo-Comox line, via Alberni, 50-3.

*Line from Ashcroft (C. P. R. Stn.) to Barkerville—Local rates 25, 50, 75 (9 offices).*

Clinton . . . . .	25-2	from Ashcroft C. P. R. Tel. office.
Bridge Creek . . . . .		" "
150-Mile House . . . . .	50-3	" "
Soda Creek . . . . .		" "
Quesnelle . . . . .		" "
Stanley . . . . .	75-5	" "
Barkerville . . . . .		" "
Lillooet (branch) . . . . .	50-3	" "
Pavillion (on Lillooet branch) . . . . .		" "

## YUKON DISTRICT.

*Line from Ashcroft, B.C., to Dawson, &c.*

*Ordinary messages—Local rate.*—Between offices above Atlin, 50c. for 10 words for each 100 miles; below Atlin, 50c. for 100 miles, and 25c. for each additional 100 miles.\* *Through rate* for the whole line same as local rate below Atlin. *Additional word rate*, beyond the 10-word message, is 10c. where the 10-word rate is from \$1 to \$2; 15c. where

\* Excepting Quesnelle-Ashcroft section of the Ashcroft-Barkerville line, the tariff for which is given elsewhere.



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\$2 to \$3; 20c. where \$3 to \$4; 25c. where \$4 to \$4.50; and 30c. where over \$4.50. Thus the tariff from Ashcroft to Dawson, a distance of 1,700 miles, is \$4.50 and 30c.

*Cable messages* (transatlantic, &c.) 40c. per word, for the whole line to or from Ashcroft.

*Press rate.*—1c. per word; minimum charge \$1.00 for the whole line.

Following is a list of 26 offices on this line, with distances between them

Name of Office	To Ashcroft.	Inter- mediate
	Miles.	Miles
Bentley	1,802½	
Forty Mile .. . . .	1,702	40
Dawson .. . . .	1,712	50½ = 90
Ogilvie .. . . .	1,664	48
Stewart River .. .	1,641	23
Selkirk .. . . .	1,566	75
Fort Selkirk .. . .	1,536	30
Five Fingers .. . .	1,478	58
Big Salmon .. . . .	1,382	96
Hootalinqua .. . . .	1,348	34
Lower Labarge .. .	1,318	30
White Horse .. . . .	1,259	59
Cariboo Crossing .. .	1,194	65
Tess .. . . .	1,176	18
Atlin .. . . .	1,101	75 = 611
Pelly River .. . . .	1,078½	22½
Naselle .. . . .	1,031	47
Naselle .. . . .	986	45
Samsky .. . . .	941	45
Telegraph Creek .. .	900	41
Iskoot .. . . .	840½	60
Echo Lake .. . . .	780	60
Hazelton .. . . .	600	180 = 700
Quesnel .. . . .	216	387
Ashcroft .. . . .		216
		1,802½
Bentley .. . . .		128
Hazelton to Fort Simpson .. .		28
Cariboo Crossing to Bennett .. .		
Total .. . . .		2,029

Summary.

Offices on government lines, as listed .. . . .	216
Offices at transfer points with connecting lines .. . . .	15
Total number embraced by the service .. . . .	231



PART VI.

REPORT OF THE COLLECTOR OF REVENUE

DEPARTMENT OF PUBLIC WORKS

1900-1901







## COLLECTION OF REVENUE

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, November 23, 1901.

F. GELINAS, Esq.,  
Secretary, Department of Public Works,  
Ottawa.

SIR,—I have the honour of submitting my report for the year ended June 30, 1901.

I have examined the books and accounts of all the officers under my control (excepting those of the dock master at Esquimalt), and it is my pleasing duty to state that in all cases the rules laid down for their guidance by the department have been carefully observed by these officers ; who have faithfully accounted for all the revenues collected by them.

It affords me much pleasure to state that the revenue accrued from public works during the past fiscal year shows a satisfactory increase over that of the year 1899-1900, the total amounting to \$112,675.82, the increase being \$33,594.35, and the collections amounting to \$103,086.41, exceeding those of the previous year by \$26,004.94.

The revenue from slides and booms was \$77,222.34, or \$20,253.01 more than the preceding year, it is only fair, however, to say that of this increase \$12,068.62 is from the Newcastle district, being accruals from 1894 to 1900, inclusive ; the collections on this account also show an increase for this year of \$10,663.60, of which \$4,807.53 was from the Newcastle district.

The graving docks yielded \$34,735.16, being \$13,244.41 more than in 1899-1900.

From the locks the receipts were \$718.32 against \$621.39 for the previous year, an increase of \$96.93—although the Rivière du Lièvre lock yielded \$71.55 less than in 1899-1900.

Having dealt in a general way with the revenue, I beg to submit the particulars in detail relating to the several services under their respective heads.

## SLIDES AND BOOMS.

## OTTAWA DISTRICT.

The tolls charged up amounted to \$43,831.50, being \$3,574.62 more than for 1899-1900.

The number of saw-logs that passed through the works was 3,419,826, or 332,947 pieces more than the preceding year.

Of square timber there was only 894 pieces, the smallest on record ; there was, however, a large increase in railroad ties and fence posts, amounting to 425,033 and 339,951 pieces respectively, while the increase in long cedars was 28,768 pieces.

All the revenue from this district was collected but the sum of \$2,328.32.

Of the dues accrued since July 1, 1889, when this department took over the collection, there remains uncollected \$9,836.30 ; full particulars of which will be found in statement No. 2 herewith.



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Of the dues accrued prior to July 1, 1889, there remains uncollected \$56,805.65, all of which should be written off. See statements Nos. 1 and 3 herewith, for details.

The accounts for the Ottawa district stands thus :

Dues accrued during the year 1900-1901.. . . .	\$ 43,831 50
Of which there was collected.. . . .	41,503 18
The amount outstanding uncollected.. . . .	2,328 32

The total amount outstanding uncollected on June 30 is more than at the same date of the previous year by this last mentioned amount, the amount year by year being as follows :—

Dues accrued prior to the collection being transferred to this department.. . . .	\$ 56,805 65
Dues of 1889-90.. . . .	\$ 6,903 05
“ 1890-91.. . . .	28 42
“ 1892-93.. . . .	379 80
“ 1896-97.. . . .	196 71
“ 1900-1901.. . . .	2,328 32
	<hr/>
	9,836 30

The increase in the amount outstanding since July 1, 1889, occurs in this way : by means of a land slide a large portion of the lower end of the Black River Slide was carried away in the spring of 1900, Messrs, McLachlin Bros. drive did not reach the slide till well on in the season when the water had fallen in the Ottawa river, hence when their logs passed through the slide they struck on the rocky bottom of the Ottawa and were injured, as they allege, to a far greater extent than the slidage amounts to, therefore they withheld these dues, amounting to \$2,328.32, and the matter is now under consideration.

Notwithstanding the apparent increase of uncollected dues, I would again call attention to the fact that since this department assumed the collection of these dues, of the amount accrued, \$669,905.98, exclusive of \$6,903.05, Chaudière boomage, which should not have been charged up, only \$28.42 of absolutely established charges remain uncollected.

The remainder outstanding ought to be written off, if my information as to the several cases be correct.

Herewith are statements in detail :

No. 1.—Statement of amounts outstanding prior to July 1, 1889, uncollected September 30, 1901.

No. 2.—Statement of dues accrued at Ottawa since July 1, 1889, uncollected September 30, 1901.

No. 3.—Statement of amounts accrued at Quebec prior to July 1, 1889, uncollected September 30, 1901.

No. 4.—Statement of the number of pieces of square timber, saw-logs, &c., which passed through the Ottawa works during the year ended June 30, 1901.

No. 5.—Statement of dues accrued from each of the slides and works in the Ottawa district during the year ended June 30, 1901.

As anticipated in my report of last year, the revenue from square timber was practically nil. However, for the current year the receipts on this account amount to \$1,660.50, and the prospects are that during the year 1902-3, this sum will be still larger, as the manufacture of this class of wood is being considerably increased this season.

I regret to have to say that again this year has the revenue fallen below the annual average anticipated when the tariff was revised in 1893, but I hope that with the building of new mills and the development of the pulp industry the revenue will soon again touch the estimated figure.



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During the year a change was made in the manner of computing the dues on pulp wood, this being for the most part of small diameter, the contents by the Doyle rule were very small and the dues charged on the 1,000 feet B.M., amounted to very little ; instead of this method, the dues are now charged on the cubic contents of the timber, 115 feet constituting a cord and the price per cord being one-half the rate levied on 1,000 feet B.M., of round timber. Thus though the rate is apparently reduced 50 per cent, we actually realized more than double the amount of money from an equal amount of wood that we did under the old way of measuring and charging.

Before closing these remarks I would again urge the desirability of bringing the question of all uncollected arrears before the Public Accounts Committee, not only those of the Ottawa district but those of the other districts as well, so as to obtain the authority of parliament to write them off, as they are a source of friction between the government and those interested, frequently preventing settlement of accounts justly due individuals, while the amounts standing against them should have been written off long ago.

## ST. MAURICE DISTRICT.

The revenue from this district was \$21,322.22, all of which was collected, being \$4,609.77 more than in 1899-1900.

There is no change to note in regard to the amount outstanding on July 1, 1900, namely, \$14,481.49, all of which, as I have said before accrued previous to my taking charge of the district in 1892, and which should all be written off, for reasons assigned in statement No. 6 herewith.

It is to be regretted that my anticipations of last year have not been realized ; owing to the early break up last spring the jobbers quit work very much earlier than was expected and every concern fell far short of the expected output, and to make matters worse the water in the River St. Maurice was never known to be so low as during the past summer, consequently large quantities of logs are hung up, that in ordinary seasons would have reached the mills and have been sawed up before this. Even the Laurentide Pulp Company, notwithstanding the ease with which they get their logs to their mills in ordinary seasons, have, I am informed, a large number still in the river, while the Belgo-Canadian Pulp Company of Shawenigan have about 300,000 logs that never reached the St. Maurice.

The works of the last mentioned company at Shawenigan Falls will, I am informed, be completed about the beginning of January next, and will require at least 1,000,000 logs a year to supply them.

The Laurentide Pulp Company will also require 1,500,000 logs annually to keep their mills running to their full capacity, and at Three Rivers, in the vicinity of 1,500,000 pieces will be needed to meet the requirements of the mills at Three Rivers, thus there will be made, if possible, that is to say, weather and circumstances permitting, this winter on the St. Maurice and tributaries nearly 4,000,000 logs.

The experience of last summer certainly seems to point to a radical change in driving the logs when the water is at a favourable height, at least down to the Piles, and if the Laurentide Pulp Company had booms of sufficient capacity to hold their logs from the nearer points and permit the logs for Shawenigan and Three Rivers to pass without the necessity of sorting, as is the case when the logs are mixed, thus saving much delay, the logs for the lower points could be driven to Shawenigan and held safely there, whence the drive to Three Rivers is a matter for the bulk of the logs of only a few hours at a favourable stage of water.

Included in the collections is the sum of \$600 rent of part of the boom property at Three Rivers for which the lease was not completed till late in the spring of 1901, though occupied since 1895.



1-2 EDWARD VII., A. 1902

## NEWCASTLE DISTRICT.

The long disputed question of rates in this district was settled by order in council of June 20 last, whereby only the charges at Fenelon and Burleigh Falls were retained, this settlement dating back to 1894, from which the revenue accrued amounts to \$12,068.62.

Statement No. 7 contains the particulars of the dues uncollected, amounting to \$11,828.46, of which \$3,521.19 should be written off in accordance with a decision in the Exchequer Court ; of the remainder accounts amounting to \$7,742.51 are in the hands of the Department of Justice for collection, \$478.58 have been collected since September 30 last, and the balance, \$85.88 I expect will shortly be paid.

## GRAVING DOCKS.

## ESQUIMALT GRAVING DOCK.

The revenue from this source shown in detail in statement No. 8 herewith, was \$12,347.87, being \$5,687.93 more than in 1899-1900.

Of the 204 days the dock was occupied, it was used by vessels of the navy for 179 days, Canadian government vessel 4 days, and the merchantile marine only used it for 21 days during the year.

## LÉVIS GRAVING DOCK.

The revenue from this work shows the large increase of \$7,005.83 over the previous year, being \$17,722.51 for the year just closed

The dock was occupied for 127 days, exclusive of winter months ; the total number of days occupied during the year was 278.

In consequence of the inconvenience caused by vessel owners docking a ship and holding it there while they decided whether to perform full repairs or, as happened, merely making it sufficiently sea-worthy to reach a point where it could be profitably disposed of, to the exclusion of other vessels requiring immediate attention, the regulations were amended to remedy this abuse and put an end to the practice, in effect, of using the dock as a convenient place of storage, instead of an institution for the speedy repair of vessels engaged in the St. Lawrence trade.

## KINGSTON GRAVING DOCK.

The income from this dock was \$4,664.78, or \$550.65 more than in 1899-1900.

The dock was occupied for 54 days, exclusive of winter months ; of the whole year it was in use for 120 days.

## LOCKS.

## RIVER DE LA VIE LOCK.

The tolls collected amounted to \$252.95, a falling off of \$43.85, compared with the preceding year.



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RIVIÈRE YAMASKA LOCK.

The receipts from this source were \$465.37, or \$140.78 more than in 1899-1900.

Thus the total collections that passed through my hands during the year ended June 30, 1901, may be summarized as follows :—

From Slides and booms.. . . . .	\$ 67,632 93
Graving docks.. . . . .	34,735 16
Locks.. . . . .	718 32
Total.. . . . .	\$ 103,086 41

The following comparative table of Public Works Revenue accrued 1899-1900 and 1900-1901, shows an increase, as above mentioned, in every service but the Rivière du Lievre lock.

	Year, 1900-1901.	Year, 1899-1900.	Increase, 1900-1901.	Decrease, 1900-1901.
SLIDES AND BOOMS	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Ottawa District.....	43,831 50	40,256 88	3,574 62	
St. Maurice District..	21,322 22	16,712 45	4,609 77	
Newcastle District ..	12,068 62		12,068 62	
	77,222 34	56,969 33	20,253 01	
GRAVING DOCKS.				
Espimault	12,347 87	6,659 94	5,687 93	
Levis	17,722 51	10,716 68	7,005 83	
Kingston	4,664 78	4,114 13	550 65	
	34,735 16	21,490 75	13,244 41	
LOCKS.				
Rivière du Lièvre .....	252 95	296 80		43 85
Rivière Yamaska .....	465 37	324 59	140 78	
	718 32	621 39	140 78	43 85
Net increase .....			96 93	
Total increase year ended 30th June, 1901				33,594 35

In conclusion, I have to acknowledge the uniform courtesy and cheerful assistance accorded me, at all times by the officers with whom I have been brought in contact during the year.

I have the honour to be, respectfully, sir,  
Your very obedient servant,

EDWARD T. SMITH,  
*Collector of Public Works Revenue.*



1-2 EDWARD VII., A. 1902

No. 1. STATEMENT of Slidage and Boomage from the Ottawa Slides and Works, accrued prior to July 1, 1889, Outstanding June 30, 1901, and remaining Uncollected on September 30, 1901.

By Whom Due.	Paid and Partially Paid.	Chaudiere Boomage in Suspense.	Other Slide and Boom Dues paid.	Total Outstanding on Sept. 30, 1901.	Year to which Dues belong.	Remarks.
	£	cts.	£	£	cts.	
John & Wm. McLean	53	14		53	14	1873, ... Insolvent.
John Rowan	342	50		342	50	1872 1873
Lemoine & Charotte.	21	30		21	30	1873
Tallon & Lapierre	148	10		148	10	1873 1874.
Mosgrove & McHarry	261	42		261	42	1873 1874
W. C. Wells	600	90		600	90	1873 1874
Dutresne & McGarity	528	80		528	80	1874 1875.
Walton Smith	171	46		171	46	1874 1875.
A. H. Baldwin.	3,507	92		3,507	92	1871 to 1874.
Hon. James Skead	9,807	65		9,807	65	1861, 1863, 1864, 1869, 1875 to 1878
Batson & Currier.	3,558	70		3,558	70	1875 to 1877.
A. F. A. Knight	546	30		546	30	1878
James Walker	11	25		11	25	1877
R. Campbell & Son.	1,558	50		1,558	50	1879 to 1881.
James G. Bryson	73	50		73	50	1886
Costello Bros.	90	62		90	62	1882
N. E. Connor	428	34		428	34	1888
James Yull	9	29		9	29	1876
J. & B. Grier.	76	84		76	84	1883.
R. & W. Conway	95	42		95	42	1882 1883
A. & P. White.	101	00		101	00	1881.
B. Caldwell & Son	4	33		4	33	1887
J. R. Booth				10,270	81	1881 to 1888.
Perley & Patten.			398	8		1881 to 1888.
The Bronsons & Weston Lumber Co.,				8,880	85	1881 to 1888.
Pierce & Co.				8,180	79	1881 to 1888.
C. A. Grier & Co.,				462	18	1888
Estate late Levi Young				1,060	59	1886 1887.
Wm. Mason				1,461	20	1881 to 1888.
				413	55	1881 to 1888.

reported in return S 38 for March, 1886.

8398 88 counterclaim for damages for breaking of Con-  
longe boom.

Chaudiere Boomage These parties claim that they  
have maintained these works wholly at their own ex-  
pense since 1881.



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Culmore & Co. John Reuther J. & C. Bryson.	406 27	272 20	406 27	12 24	Counters for damages by breaking of Culmore works
	278 28		278 28	12 24	
			278 28	12 24	
			278 28	12 24	
	23,097 28	31,005 54	64,103	35 63	

EDWARD T. SMITH,  
*Collector of Slide and Boom Dues*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1901



1-2 EDWARD VII., A. 1902

Summary of Slide and Boom Due, accrued from the Ottawa River Works since July 1, 1889, Outstanding on September 30, 1901.

Name	Year to which Due belongs.	Chaudre Boonage Suspense.	Ordinary Due.	Total Outstanding	Remarks.
		£	cts.	£	cts.
J. R. Booth	1889 90	2,561 69		2,561 69	
The Brimons & Weston L. Co.	1889 90	2,056 96		2,056 96	
Petley & Potter	1889 90	1,203 26		1,203 26	Chaudre Boonage reported to Council, and referred to the Treasury Board, should be written off.
Wm. Mason & Sons	1889 90	167 66		167 66	
Pierce & Co.	1889 90	913 48		913 48	
Alex. Fraser & Co. Trustees	1890 91		28 42	28 42	Legal action taken to recover this.
J. R. Booth	1892 93		379 80	379 80	Retained by Mr. Booth in settlement of an account due him which the Auditor General refuses to pay, as Mr. Booth appears to be in arrears in this and Statement No. 1.
Byron & Flett	1896		196 71	196 71	Have counterclaim for work done on slide to this amount.
McLachlan Bros.	1900		2,328 32	2,328 32	Have counterclaim for damages to logs in consequence of break in Black River slide.
		6,905 05	2,935 35	9,836 30	

EDWARD T. SMITH,  
*Collector of Slide and Boom Due.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1901.



## SESSIONAL PAPER No. 19

## No. 3.—STATEMENT of Outstanding Slide Dues, Ottawa District, Bonds for which were sent to Quebec for collection.

Name.	From 1860.	From 1861.	Total.
	\$   cts.	\$   cts.	\$   cts.
Hon. James Skeed	245 00	210 00	455 00
James Mair		696 75	696 75
	245 00	906 75	1,151 75

These amounts were uncollected, as the parties claimed damages for loss caused by the Madawaska boom breaking away in 1860.

A decision on their claims was not arrived at till August 2, 1869. On the 5th idem, Messrs. Skeed and Mair were notified that the department could not recognize their claim.

To the best of my knowledge, this decision was never communicated to the collector of slide dues, consequently these accounts remained in abeyance.

Since then both parties died, and I believe both were insolvent at the time of their death.

EDWARD T. SMITH,

*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,

OTTAWA, September 30, 1901.

No. 4. STATEMENT of the number of pieces of square timber, saw-logs, &c., that passed through the government slides and works on the River Ottawa and its tributaries during the fiscal year ended June 30, 1901.

	Pieces.
Square timber.. . . . .	894
Saw-logs.... . . . .	3,419,826
Boom and dimension timber.. . . . .	148,132
Cedars.. . . . .	67,239
Railroad ties.. . . . .	826,311
Fence posts.. . . . .	479,723
Total.. . . . .	4,942,125

Also 20,784 $\frac{3}{4}$  cords pulp wood.

The revenue accrued on the above was \$43,831.50

EDWARD T. SMITH,

*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,

OTTAWA, September 30, 1901.



1-2 EDWARD VII., A. 1902

No. 5. STATEMENT showing the dues accrued on the undermentioned works on the River Ottawa and its tributaries during the fiscal year ended June 30, 1901.

River or Other Improvement.	Amount.
Main Ottawa.. . . . .	\$ 2,931 37
Cheneaux boom.. . . . .	7,090 86
River Petewawe.. . . . .	8,513 88
“ Madawaska.. . . . .	4,682 34
“ Coulonge.. . . . .	6,505 20
“ Dumoine.. . . . .	620 80
Black River.. . . . .	5,294 81
Gatineau.. . . . .	8,192 24
Total.. . . . .	<hr/> \$ 43,831 50 <hr/>

Amounting to \$43,831.50.

EDWARD T. SMITH,

*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, September 30, 1901.



## SESSIONAL PAPER No. 19

No. 6.—STATEMENT of Slide and Boom Dues from the St. Maurice Slides and Works, outstanding on 30th June, 1892, and remaining uncollected on the 30th September, 1901.

Name.	Year to which Dues belong.	Amount.	Total.	Remarks.
		\$ cts.	\$ cts.	
George Baptist, Son & Co	1878	469 95		
"	1879	2,110 62		
"	1880	1,696 18		
"	1881	293 69		
"	1882	165 80		
"	1884	118 50		
"	1885	4 28		
			4,859 02	Have counter claims for damages to logs caused by the booms not being stretched early enough in the spring of 1878 to prevent the logs going over the hutes.
Ross, Ritchie & Co	1878	3,072 84		
"	1883	2,173 68		
"	1884	28 96		
"	1886	1 62		
"	1887	4 38		
			5,281 48	These claims were submitted to Special Commissioner, Mr. McDougall, afterwards Judge, who, after hearing the evidence on both sides, recommended that the claims of the parties should be allowed.
Alex. Baptist	1879		2,116 96	
Wm. Ritchie & Co.	1888	779 24		
"	1889	332 11		
			1,111 35	Of this amount, \$754.20 is claimed to be an overcharge. Insolvent.
Ritchie Bros . . . .	1886	413 43		
"	1887	634 71		
			1,048 14	This amount is composed of overcharges in 1886 and 1887 of \$842.76 and overpayment in 1884 of \$205.38.
G. B. Hall . . . .	1890		49 34	Insolvent
T. E. Normand	1890		14 28	Claims that this balance is an overcharge.
Treble Biron . . .	1891		0 92	Would cost more to collect than it is worth.
			14,481 49	

To make this balance agree with the Public Accounts, there should be deducted \$7.93 over credited Alex. Baptist, and \$217.17 added thereto, being \$190.40 paid 23rd July, 1884, and \$26.77 over charged in error to Wm. Little, not in any of the collector's returns, which will give balance due 30th September, 1894, of \$14,690.73.

EDWARD T. SMITH,

*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, 30th September, 1901.



1-2 EDWARD VII., A. 1902

No. 7.—STATEMENT of Slide and Boom Dues accrued from the Newcastle and Trent River Works, Outstanding on the 30th June, 1901, and remaining Uncollected on the 30th September, 1901.

Name.	Year to which Dues Belong.	Amount Disputed.	Ordinary Dues.	Total.	Remarks.
		\$ cts.	\$ cts.	\$ cts.	
Irwin & Boyd. ....	1881.	59 79		59 79	
Thomson & McArthur.	1880 ..	52 78		52 78	
Jabez Thurston.....	1882. ....	12 50		12 50	
McDougall & Ludgate.	1879. ....	65 07		65 07	Insolvent.
Bigelow & Trounce ...	1882 to 1885. ....	216 21		216 21	
R. & G. Strickland....	1882, '83, '85, '86 and '87..	215 08		215 08	
Est. late Geo. Hilliard.	1877 to 1883 and 1886....	354 15		354 15	Dead and estate distributed.
T. G. Hazlett.....	1881, '82, '84 to '89.....	885 25		885 25	
J. M. Irwin. ....	1882, '83, '85 to '88.....	698 45		698 45	
D. Ulyott.....	1881 to 1887. ....	547 68		547 68	According to judgment in Exchequer Court, <i>re</i> Boyd <i>vs.</i> Smith, these cannot be collected.
Green & Ellis.....	1881 to '83, '85, '88 and '89	157 01		157 01	
A. W. Parkin.....	1884, '85 '88 '90 and '91...	65 92		65 92	
The Dickson Estate. ...	1883 .....	137 50		137 50	
Alfred McDonald. ....	1888 .....	40 80		40 80	
John Parkin.....	1889 .....	13 00		13 00	
Gilmour & Co.....	1893, '94, '95, 1900. ....		4,412 64	4,412 64	These 6 accounts sent to Department of Justice for collection.
The Dickson Company	1894 to 1900. ....		1,762 69	1,762 69	
Sam. G. Parkin.....	1897, '98 and 1900..		75 93	75 93	
Dominion Bank.....	1894, '95 '96 ..		209 40	209 40	
Mosson Boyd Co.....	1895, '96, '98, '99, 1900.		1,376 18	*1,376 18	
John Carew.....	1894 to 1900. ....		348 85	348 85	
C. Young.....	1895, 1898.. ..		18 56	18 56	
Chas. Wynn.....	1894, '95, '96 .....		67 32	67 32	
John Dovey .....	1894, '95, '96 .....		35 70	35 70	Sent to Department of Justice for collection.
		3,521 19	8,307 27	11,828 46	

EDWARD T. SMITH,

*Collector of Slide and Boom Dues.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, 30th September, 1901.



## SESSIONAL PAPER No. 19

## No. 8. The Dry Dock at Esquimaux, B.C.

STATEMENT of Dues and other charges collected during the year ended June 30, 1901.

Name of Vessel Docked	Tons	Period of Dockage		Dockage Charges.	Other Charges	Total
		From	To			
		1900.	1901.	\$ cts.	\$ cts.	\$ cts.
H.M.S. Virago.	265	June 21	Proving	249 24		249 24
Arethusa.	4,300	July 9	July 11	308 32		308 20
(Short paid on H.M.S. Arethusa in July) (Overpaid).				0 03		0 03
H.M.S. Sparrowhawk	265	June 29	Aug. 14	1,276 52		1,276 52
Ship Hawaiian Isles.	2,097	Aug. 31	Sept. 1	400 00	1 80	401 80
Str. Dolphin.	843	Sept. 1		300 00		300 00
Barque R. E. Wood.	1,447	Oct. 8	Oct. 9	350 00		350 00
H.M.S. Phaeton.	4,300	11	20	363 00		363 00
Str. Buckingham.	2,879	26	28	498 00	3 00	501 00
Marine Railway Co., 2,000 galls. water at 60c. per mill.					1 20	1 20
Langley, Logan & Co., 5,000 galls. water at 60c. per mill.					3 00	3 00
H.M.S. Icarus & Pheasant.	970	Oct. 29	Nov. 20	835 14		835 14
Barque Carolina.	1,450	Dec. 4	Dec. 6	415 25	5 40	420 65
H.M.S. Egeria.	940	Nov. 21	Nov. 28	302 50		302 50
" Virago.	265	Dec. 10	Dec. 22	437 70		437 70
" Sparrowhawk.	265	17				
		1901.	1901.			
Str. Port Stephens.	3,554	Feb. 19	Feb. 21	511 08	5 40	516 48
H.M.S. Warspite.	8,400	Jan. 2	" 16	1,976 39		1,976 39
" Virago.	265	Mar. 6	Mar. 23	615 85		615 85
Barque Still Water.	1,130	April 22	April 28	608 75		608 75
SS. Adato.	3,346	30	May 2	506 92		506 92
H.M.S. Sparrowhawk and 12 tons	265	May 2	13	457 76		457 76
SS. Condor.	3,050	May 31	June 2	501 00	1 20	502 20
Govt. Str. Quadra.	573	April 18	April 21	385 95		385 95
H.M.S. Icarus.	970	May 14	May 29	531 27		531 27
" Condor.	980					
SS. Victoria.	2,354	June 10	June 12	487 20	9 00	496 20
	46,328			12,317 87	30 00	12,347 87

EDWARD T. SMITH,

*Collector of Public Works Revenue*

DEPARTMENT OF PUBLIC WORKS,

Ottawa, September 30, 1901.



1-2 EDWARD VII., A. 1902

No. 9.—The Dry Dock at Lévis.

STATEMENT of Dues and other charges collected during the Year ending June 30, 1901

Name of Vessel Docked.	Tonnage.	PERIOD OF DOCKAGE		Dockage Charges.	Other Charges.	Total.
		From	To			
		1900.	1900.	\$ cts.	\$ cts.	\$ cts.
SS. Scottish King. . . . .	3,317	Aug. 17.	Entry fee.	200 00		200 00
		" 17	Sept. 28	5,086 28	46 75	5,133 03
SS. Ottoman.....	4,843	Oct. 20	Oct. 29..	1,521 74	10 75	1,532 49
SS. Turret Bay.....			Entry fee.	200 00		200 00
			" ..	200 00		200 00
SS. Campana....	2,211	Oct. 30..	Nov. 12..	1,424 86	13 75	1,438 61
			Entry fee.	200 00		200 00
		1901.	1901.			
SS. Campana, wintering	1,697			800 00	3 00	803 00
SS. Ashanti.....	3,389	May 4.	May 30..	3,518 48	7 70	3,526 18
SS. Aggi.....			Entry fee.	200 00		200 00
	3,277	May 31..	June 20..	2,510 80	13 50	2,524 30
SS. Louisiana .			Entry fee.	200 00		200 00
	1,973	June 24.	June 29..			
cargo. . . . .	100	" 24.	" 29..	657 30		657 30
SS. Bogstad .....	3,058		Entry fee.	200 00		200 00
Dredges Nos. 8 and 6, wintering				300 00	2 00	302 00
Dredge Laval.....	296	April 26.	May 30..	403 60	2 00	405 60
	24,161			17,623 06	99 45	17,722 51

EDWARD T. SMITH,  
*Collector of Public Works Revenue*

DEPARTMENT OF PUBLIC WORKS,  
Ottawa, September 30, 1901.



SESSIONAL PAPER No. 19

No. 10 The Dry Dock at Kingston, Ont.

STATEMENT of Dues and Other Charges collected during the Year ending June 30, 1901.

Name of Vessel or Dock	Period of Docking		Days	Dues	Charges	Total.
	From	To				
	1900	1901		\$	\$	\$
Str. Chieftain	July 1	July 1	120 40		120 40	
Str. Donnelly	1	3	108 46		108 46	
Str. Tecumseh	8-10	6	134 00		134 00	
Tug M. M. Drake	1-10	7	20 00		20 00	
Barge Bella	8-10	11	75 00		75 00	
Barge Ceylon	7-14	13	100 98		100 98	
Str. Ramona	7-7	8	40 00		40 00	
Barge Nebraska	1-14	2	62 80		62 80	
Derrick	4-17	28	25 00		25 00	
Str. Ramona	8-7	1	77 40		77 40	
Str. Ramona	1-1	1	5 00		5 00	
Str. Ramona	7-7	7	20 00		20 00	
Str. Ramona	12-3	6	24 60		24 60	
Str. Ramona	5-5	6	20 00		20 00	
Str. Ramona	7-7	1	20 00		20 00	
Tug Jessie Hall	8-9	10	119 20	3 00	119 20	
Derrick	1-1	2	5 00		5 00	
Tug Regina	1-1	2	67 70		67 70	
Barge Bella	4-4	20	90 80		90 80	
Barge Ceylon	9-8	8	151 30		151 30	
SS. Bannockburn	1-10	11	123 40		123 40	
Barge Selkirk	7-11	18	121 90		121 90	
Str. M.	1-1	1	154 10		154 10	
Str. North King	8-8	3	25 00	10 00	25 00	
Tug Jessie Hall	7-7	3	25 00	5 00	25 00	
Str. D. D. Calvin	7-7	3	135 50		135 50	
The Montreal Transportation Co						
Tug Jessie Hall	56	12	Dec. 19			
Tug Thompson	18	1	19			
			1901.	91 50	15 75	708 25
SS. L.	1,620	16	16			
Str. Chieftain	1-22	22	April 23	87 00		87 00
Str. Chieftain	380	23	26	159 08		159 08
Str. L.	976	May	May	42 42	5 00	251 42
Tug Bronson	137	10	11	42 65	5 00	47 65
Dredge Queen and 2 scows	10	10	11	52 75		52 75
Barge Regina	441	16	17	88 20		88 20
Str. Empire State	29	29	29	86 50		86 50
Barge Melrose	7-30	30	30	126 80		126 80
Str. Brockville	191	5	6	38 20		38 20
Barge Kildonan	44	18	18	102 30		102 30
Str. L.	719	20	20	121 00		121 00
Fuel and Derrick		21	21		15 00	15 00
Str. Bothnia	833	29	July 2	231 00		231 00
				88 03	76 75	4,664 78

EDWARD T. SMITH,

Collector of Public

DEPARTMENT OF PUBLIC WORKS

OTTAWA, September 20, 1901.







PART VII.  
MISCELLANEOUS.

ACTS OF PARLIAMENT, PASSED AT SESSION OF 1901, HAVING REFERENCE TO THIS DEPARTMENT.

CONTRACTS LET BY THE DEPARTMENT.

PROPERTY PURCHASED OR SOLD.

PROPERTY LEASED TO OR BY THE DEPARTMENT.

CURATOR'S REPORT, NATIONAL ART GALLERY.

NAMES OF CHIEF OFFICERS OF THE DEPARTMENT.

NAMES OF OFFICIALS EMPLOYED ON SLIDES AND BOOMS.

NAMES OF PERSONS EMPLOYED ON GRAVING DOCKS.

NAMES OF ENGINEERS, FIREMEN AND CARETAKERS OF PUBLIC BUILDINGS.

AND THE OFFICIAL CORRESPONDENCE OF THE DEPARTMENT

FOR THE

FISCAL YEAR ENDED JUNE 30, 1901.







OTTAWA, November 18, 1901.

SIR,—I have the honour to transmit herewith the following statements concerning the transactions of the department during the last fiscal year with respect to contracts and property, and which are required for insertion in the annual report, 1900-1, viz.:—

No. 1.—Statement of contracts let by this department during the fiscal year ended June 30 last.

No. 2.—Statement of property purchased and sold by this department during the same period.

No. 3.—Statement of property leased to and by the said Department of Public Works during the same period; and

No. 4.—A list of some of the Public Acts of the Parliament of Canada, passed at the last session, and having reference to the department.

I have the honour to be, sir,

Your obedient servant,

J. A. CHASSE.

*Law Clerk.*

FRED. GELINAS, Esq.,

Secretary of the Department of Public Works,  
Canada.







LIST  
OF SOME OF THE  
ACTS OF PARLIAMENT  
PASSED AT THE SESSION OF 1901  
HAVING REFERENCE TO THE  
DEPARTMENT OF PUBLIC WORKS OR WORKS UNDER ITS CHARGE







LIST of some of the Public Acts of the Parliament of Canada, passed at the First Session of the Ninth Parliament, closed by Prorogation on May 23, 1901, and Orders of the Governor General in Council having reference to the Public Works Department or works under its charge (Edward VII.).

Subject	Full Title of the Statute.	Chap- ter.	Page in Statute Book.
Sums granted to His Majesty for the financial year ending June 30, 1901, and the purpose for which they are granted.	An Act for granting to His Majesty certain sums of money required for defraying certain expenses of the public service for the financial year ending June 30, 1901, and for other purposes relating to the public service.....	1	3
Sums granted to His Majesty for the financial years ending respectively June 30, 1901, and June 30, 1902.	An Act for granting to His Majesty certain sums of money for the public service of the financial years ending respectively June 30, 1901, and June 30, 1902.	2	5

N.B.—On May 13, 1901, the regulations for the preservation of health and the mitigation of disease among persons employed in the construction of public works, established by the Order in Council of January 31, 1900, were rescinded and annulled, and new regulations were made in lieu thereof. (*See Orders in Council, page LXXV.*)







## STATEMENTS

### SHOWING

1st.—CONTRACTS LET BY THE DEPARTMENT OF PUBLIC WORKS OF CANADA, FROM JUNE 30, 1900, TO JUNE 30, 1901.

2nd.—PROPERTY PURCHASED OR SOLD BY THE DEPARTMENT OF PUBLIC WORKS DURING THE FISCAL YEAR ENDED JUNE 30, 1901.

3rd.—PROPERTY LEASED TO AND BY THE DEPARTMENT OF PUBLIC WORKS DURING THE FISCAL YEAR ENDED JUNE 30, 1901.



1-2 EDWARD VII., A. 1902

No. 1.—CONTRACTS let by the Department of Public Works of Canada from the 30th June, 1900, to the 30th June, 1901.

Works.	Names of Contractors.	Date of Contract.	Amount.
			\$ cts.
PUBLIC BUILDINGS.			
<i>Government House, Parliament and Departmental Buildings.</i>			
Parliament and Departmental Buildings—Supply of ice.....	New Capital Ice Co..	March 26, 1901	258 32
Parliament and Departmental Buildings—Supply of coal.....	John Heney & Son...	July 3, 1900	25,646 37
<i>New Scotia.</i>			
Amherst, Post Office building. Supply of coal.	A. A. Jones .....	Aug. 20, 1900	265 17
Annapolis " "	Canada Coals & Ry. Co..	" 22, 1900	195 99
Antigonish " "	James Kenna .....	" 20, 1900	125 00
Arichat " "	Isidore LeBlanc & Co...	" 21, 1900	72 50
" Savings Bank " "	" .....	" 21, 1900	36 25
" Custom House " "	" .....	" 21, 1900	36 25
Baddeck, Post Office " "	James Kenna .....	" 20, 1900	148 50
Dartmouth " "	" .....	" 20, 1900	250 00
Digby, construction of a public building.....	James Reid .....	Oct. 24, 1900	16,940 00
Halifax, Dominion Building. Supply of coal.	S. Cunard & Co. ....	Aug. 22, 1900	165 00
" Asst. Rec. Gen'l's Office " "	" .....	" 22, 1900	52 00
" Immigration Building " "	" .....	" 22, 1900	377 53
" Examining Warehouse " "	" .....	" 22, 1900	192 50
Kentville, Post Office " "	Acadia Coal Co'y. ....	" 25, 1900	123 15
Liverpool " "	James Kenna .....	" 20, 1900	" "
Lunenburg " "	John B. Young.....	" 24, 1900	171 25
New Glasgow " "	Acadia Coal Co. ....	" 25, 1900	186 45
North Sydney " "	James Kenna.....	" 20, 1900	202 50
Pictou " "	Acadia Coal Co.....	" 25, 1900	145 14
" Custom House " "	" .....	" 25, 1900	145 15
Springhill, construction of public building ....	James Reid.....	Oct. 24, 1900	15,275 00
Sydney, Post Office. Supply of coal.	T. F. Routledge.....	Aug. 21, 1900	82 50
Truro " "	Acadia Coal Co'y. ....	" 25, 1900	200 00
Windsor " "	F. W. Dimock.....	" 21, 1900	180 45
Yarmouth " "	Killam Bros. ....	" 23, 1900	288 00
<i>Prince Edward Island.</i>			
Charlottetown, Dominion Building.—Supply of coal .....	A. Pickard & Co.. ....	Aug. 20, 1900	459 50
Montague, Post Office. Supply of coal.....	George Wightman.....	" 20, 1900	67 08
Summerside " "	R. T. Holman.....	" 20, 1900	285 41
<i>New Brunswick.</i>			
Bathurst, Post Office. Supply of coal .....	Henry White.....	Aug. 20, 1900	402 84
Chatham " "	R. R. Call .....	" 18, 1900	308 78
Fredericton " "	Pat. Farrell.....	" 20, 1900	230 15
Moncton " "	Canada Coals & Ry. Co..	" 22, 1900	267 00
Newcastle " "	R. R. Call.....	" 18, 1900	320 42
St. John (North) Post Office (Portland) "	R. P. & W. F. Starr ...	Sept. 1, 1900	25 38
" (West) " (Carleton) .....	" .....	" 1, 1900	27 95
" Post Office " "	" .....	" 1, 1900	498 87
" Savings Bank " "	" .....	" 1, 1900	230 60
" Custom House " "	" .....	" 1, 1900	1,171 09
" " " " " "	J. S. Gibbon & Co. ....	" 3, 1900	28 53
St. Stephen, Post Office " "	A. I. Teed & Co....	Aug. 20, 1900	95 00
Sussex post office. Supply of coal.....	H. H. Parlee .....	Aug. 30, 1900	" "
Tracadie-Lazaretto " "	R. R. Call.....	" 18, 1900	655 42
Woodstock post office " "	A. I. Teed & Co....	" 20, 1900	201 98



## SESSIONAL PAPER No. 19

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract.	Amount.
PUBLIC BUILDINGS— <i>Continued.</i>			\$ cts.
<i>Quebec.</i>			
Aylmer post office. Supply of coal . . .	J. G. Butterworth & Co	Aug. 18, 1900	183 68
Berthierville " " " " " " " " " " " "	F. O. Lamarche. . . . .	Sept. 1, 1900	72 83
Buckingham—Construction of a post office bld'g.	L. J. Fauteux . . . . .	11, 1900	8,490 00
Coaticook post office. Supply of coal . . .	B. J. Smith. . . . .	Aug. 18, 1900	162 23
Drummondville—Construction of a public bld'g.	Paquet & Godbout . . .	Nov. 22, 1900	8,200 00
Dundee custom house. Supply of coal . . .	Allen S. Matthews . .	Aug. 18, 1900	25 00
Farnham post office " " " " " " " " " " " "	J. A. Lequin . . . . .	22, 1900	180 00
Fraserville " " " " " " " " " " " "	Nap. Dion. . . . .	27, 1900	20,737 00
Hochelaga—Construction of a post office, &c., building	O. Martineau et Fils. . .	Feb'y 4, 1901	1,600 00
Hull post office.—Heating apparatus	Jos. Bourque et Chs. Le Moine. . . . .	Dec. 22, 1900	126 79
Joliette " " " " " " " " " " " "	M. H. Leprohon & Co..	Aug. 27, 1900	80 13
Lachine " " " " " " " " " " " "	Bell Bros. & Co. . . . .	20, 1900	120 60
Laprairie " " " " " " " " " " " "	Aimé Bourassa. . . . .	21, 1900	742 75
Montreal " " " " " " " " " " " "	T. F. Moore & Co. . . . .	22, 1900	198 28
" " revenue building " " " " " " " " " " " "	" " " " " " " " " " " "	22, 1900	547 75
" " custom house " " " " " " " " " " " "	" " " " " " " " " " " "	22, 1900	1,816 60
" " examining warehouse " " " " " " " " " " " "	" " " " " " " " " " " "	22, 1900	2,069 00
Péribonka—Construction of an immigration shed.	A. Godbout. . . . .	Oct. 4, 1900	139 66
Quebec marine agency. Supply of coal . . .	Archer & Co . . . . .	Aug. 25, 1900	73 50
" " post office " " " " " " " " " " " "	" " " " " " " " " " " "	25, 1900	155 60
" " St. Roch's post office " " " " " " " " " " " "	" " " " " " " " " " " "	25, 1900	366 40
" " culiers' office " " " " " " " " " " " "	Jos. Gingras. . . . .	25, 1900	284 41
" " customs house " " " " " " " " " " " "	" " " " " " " " " " " "	25, 1900	219 18
" " marine agency " " " " " " " " " " " "	" " " " " " " " " " " "	25, 1900	14 80
" " examining warehouse " " " " " " " " " " " "	" " " " " " " " " " " "	25, 1900	425 86
" " immigration building " " " " " " " " " " " "	" " " " " " " " " " " "	25, 1900	2,550 00
" " post office " " " " " " " " " " " "	" " " " " " " " " " " "	25, 1900	4,527 00
" " H. E. quarters citadel—Heating apparatus	Bennett & Wright Co. Ltd	May 3, 1901	176 35
" " Louise embankment—Construction of shed for immigrants . . . . .	Achille Dugal. . . . .	" 7, 1901	219 32
Richmond post office. Supply of coal . . .	J. D. Smith . . . . .	Aug. 18, 1900	2375 00
Rimouski " " " " " " " " " " " "	H. G. Lepage. . . . .	21, 1900	56 24
Roberval—Construction of immigration shed, . . .	A. Godbout. . . . .	Oct. 4, 1900	309 28
St. Henri post office. Supply of coal . . .	T. F. Moore & Co. . . .	Aug. 22, 1900	181 44
St. Hyacinthe " " " " " " " " " " " "	C. Rouleau et Fils . . .	20, 1900	72 00
St. Jerome " " " " " " " " " " " "	Chs. Godmer. . . . .	20, 1900	283 24
St. Johns " " " " " " " " " " " "	Simard et Fils. . . . .	20, 1900	313 60
Sherbrooke " " " " " " " " " " " "	J. D. Smith . . . . .	18, 1900	190 50
Sorel " " " " " " " " " " " "	Alexis Martin . . . . .	23, 1900	336 55
Three Rivers " " " " " " " " " " " "	Harry Buckley. . . . .	24, 1900	46 00
" " customs house " " " " " " " " " " " "	" " " " " " " " " " " "	24, 1900	1,100 00
Valleyfield post office " " " " " " " " " " " "	M. Leger. . . . .	20, 1900	
Victoriaville " " fittings.. . . .	Paquet et Godbout . . .	Feb'y 5, 1901	
<i>Ontario.</i>			
Almonte post office. Supply of coal . . .	Wm. McArthur. . . . .	Aug. 20, 1900	140 80
Amherstburg " " " " " " " " " " " "	John Mann & Sons. . . .	21, 1900	144 78
Arnprior " " " " " " " " " " " "	J. S. Moir. . . . .	20, 1900	201 00
Barrie " " " " " " " " " " " "	John Mann & Sons. . . .	21, 1900	190 75
Belleville " " " " " " " " " " " "	The Rathbun Co'y . . . .	23, 1900	373 10
Berlin post office. Supply of Coal. . . . .	John Mann & Sons. . . .	Aug. 21, 1900	129 83
Brampton " " " " " " " " " " " "	R. J. McCallum. . . . .	" 21, 1900	127 60
Brantford " " " " " " " " " " " "	F. Wilson . . . . .	" 21, 1900	294 86
Brockville " " " " " " " " " " " "	The Central Canada Coal Co. . . . .	Nov. 20, 1900	359 49
Carleton Place " " " " " " " " " " " "	Taylor Bros. & Co. . . . .	Aug. 20, 1900	125 00
Chatham " " " " " " " " " " " "	A. Crow . . . . .	" 20, 1900	131 28
Cobourg " " " " " " " " " " " "	J. R. Downey & Co . . . .	" 20, 1900	166 25
Cornwall " " " " " " " " " " " "	A. F. Mulkern & Co. . . .	" 23, 1900	236 00



1-2 EDWARD VII., A. 1902

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract.	Amount.
PUBLIC BUILDINGS. <i>Continued.</i>			
<i>Ontario.</i>			\$ cts.
Deseronto—Construction of foundation for public building.....	Alex. Newlands.....	Nov. 2, 1900	3,200 00
" Construction of public building.....	Richard Sheehy.....	June 25, 1900	25,687 00
Dundas post office. Supply of Coal.....	C. Sturrock.....	Aug. 20, 1900	16 85
" construction of armoury building.....	Joseph Bowman & Co.....	Oct. 24, 1900	8,770 00
Galt post office. Supply of Coal.....	A. J. Colvin.....	Aug. 20, 1900	146 70
Gananoque post office custom house ".....	The Rathbun Co'y.....	23, 1900	169 15
Goderich post office ".....	John Mann & Sons.....	21, 1900	126 77
Guelph ".....	Kloepfer & Co.....	21, 1900	153 94
Hamilton ".....	The Ellias Rogers Co.....	20, 1900	689 70
" ".....	Thos. Myles & Sons.....	22, 1900	21 50
Ingersoll ".....	John Mann & Sons.....	21, 1900	204 93
Kingston ".....	W. G. Craig & Co.....	18, 1900	238 95
" custom house ".....	".....	18, 1900	307 98
" construction of a military college and hospital building.....	Sullivan & Langdon.....	May 1, 1900	12,923 00
Lindsay post office. Supply of Coal.....	McLennan & Co.....	Aug. 18, 1900	156 80
London ".....	John Mann & Sons.....	21, 1900	417 50
" custom house ".....	".....	21, 1900	461 74
Napanee post office ".....	F. E. Van Luven.....	20, 1900	210 00
Niagara Falls post office ".....	John Mann & Sons.....	21, 1900	154 09
Orangeville ".....	J. R. Lathwell.....	20, 1900	166 80
Orillia ".....	John Mann & Sons.....	21, 1900	155 43
Paris—Construction of a public building.....	Wm. Griffiths.....	Oct. 24, 1900	16,500 00
Pembroke post office. Supply of Coal.....	Dunlop & Co.....	Aug. 18, 1900	211 42
Peterborough ".....	A. J. McClellan.....	18, 1900	153 44
" custom house ".....	".....	18, 1900	179 39
Petrolia post office ".....	John Mann & Sons.....	21, 1900	146 95
Picton—Construction of public building.....	Robert Cameron.....	23, 1900	13,800 00
" construction of heating apparatus.....	".....	Feb'y. 14, 1901	1,895 00
Port Arthur post office. Supply of Coal.....	Harstone Bros.....	Aug. 21, 1900	132 00
Port Hope ".....	W. T. Clarke.....	18, 1900	218 30
Prescott ".....	James Buckley.....	18, 1900	89 80
" custom house ".....	".....	18, 1900	148 17
Rat Portage post office ".....	Western Coal Co'y. Ltd..	21, 1900	363 13
" public building—Supply of electric current.....	The Citizens Telep. and Elect. Co., Ltd.....	July 14, 1900	Per 1,000 Watts 10
St. Catharines—Construction of a drill hall.....	Wm. Garson.....	Oct. 29, 1900	56,000 00
" post office Supply of Coal.....	W. H. McCordick.....	Aug. 29, 1900	85 50
" ".....	B. D. Voisard & Sons.....	20, 1900	85 76
St. Thomas post office Supply of Coal.....	Ellison & Lewis.....	20, 1900	156 60
" Construction of an armoury building.....	J. M. Green & Co.....	Feb'y. 26, 1901	29,793 00
Sarnia—Construction of a public building.....	Geo. A. Proctor.....	Sept. 17, 1900	62,500 00
Smith's Falls post office Supply of Coal.....	A. Foster.....	Aug. 20, 1900	125 41
Stratford post office ".....	Angus Johnson.....	20, 1900	327 28
Strathroy ".....	Alex. Reed.....	18, 1900	164 55
Toronto Union station—Alterations of and additions to newspapers sorting room and elevator tower.....	John Hanrahan.....	23, 1900	11,666 00
Toronto—Union station. Supply of current for elevator newspaper sorting room.....	The Toronto Electric Light Co. Ltd.....	Dec. 18, 1900	Per 1,000 Watts 08
Toronto—117 King west. Supply of current for lighting post office.....	" ".....	Nov. 1, 1900	20
Toronto—Custom house. Supply of current for running elevator.....	".....	21, 1900	08
Toronto—Custom House. Supply of coal.....	The Ellias Rogers Co.....	Aug. 20, 1900	374 21
" Examining warehouse ".....	".....	20, 1900	740 95
" Post office ".....	".....	20, 1900	683 20
" Revenue office ".....	".....	20, 1900	279 90
Trenton—Post office ".....	Chs. Crowe.....	20, 1900	138 60



## SESSIONAL PAPER No. 19

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract.	Amount.
PUBLIC BUILDINGS— <i>Continued.</i>			\$ cts.
<i>Ontario—Continued.</i>			
Walkerton—Post office Supply of coal.	Traill Bros . . . . .	Aug. 21, 1900	177 25
Windsor . . . . .	Scully & Bridges . . .	" 20, 1900	256 05
" Construction of a drill hall . . . . .	Sullivan & Loughden	" 11, 1900	49,633 00
<i>Manitoba.</i>			
Brandon—Experimental farm. Supply of Coal	D. M. McMillan . . . . .	" 20, 1900	37 25
" " " "	The Hanbury Mnf. Co	" 20, 1900	120 40
" Post office " "	" " "	" 20, 1900	619 50
Portage LaPrairie—Public building	Wanacott & Co	" 21, 1900	189 35
Winnipeg—Custom house " "	" " "	" 21, 1900	593 56
" Immigrant office and shed " "	" " "	" 21, 1900	317 68
" Ind. off. & crown timber off. " "	" " "	" 21, 1900	267 52
" Examining warehouse " "	" " "	" 21, 1900	475 52
" Post office " "	The Alberta Ry. & Coal Co . . . . .	" 21, 1900	1,313 15
<i>North-west Territories.</i>			
Edmonton—Dominion land's office. Supply of coal.	Wm. Hamberstone	Sept. 14, 1900	144 95
Indian Head—Experimental farm " "	Geo. Thompson . . .	Aug. 21, 1900	250 00
Lethbridge—Post office " "	John Brodie	Sept. 15, 1900	172 30
MacLeod—Court house " "	A. F. Grady . . . . .	" 4, 1900	40 00
" Custom house " "	" " "	" 4, 1900	97 50
Moose Jaw—Court house " "	R. Beard . . . . .	Aug. 30, 1900	100 00
Red Deer—Dominion land's office " "	Jas. M. Smith	" 21, 1900	75 17
Regina—Land's office. Construction of heating apparatus . . . . .	T. & R. Cotter. . .	Dec. 27, 1900	1,138 00
Regina—Court house. Supply of Coal . . .	Rembler Paul. . .	Aug. 25, 1900	685 00
" Post office " "	" " "	" 25, 1900	235 00
" Lands title office " "	" " "	" 25, 1900	118 30
Regina—Dominion land's office " "	" " "	" 25, 1900	130 00
Strathcona—Construction of immigration building. . . . .	Robert Jean Manson.	" 24, 1900	3,350 00
<i>British Columbia.</i>			
Kamloops—Construction of public building . . . . .	Robert Mackey. . .	Oct. 27, 1900	10,820 00
Nelson—Construction of post office, custom and inland revenue office . . . . .	T. Viau & Chs. LeMoine.	Jan. 31, 1901	49,900 00
Rossland—Construction of public building. . . . .	Thos. Bradbury . . . . .	Nov. 3, 1900	44,650 00
Vancouver—Construction of an addition to drill hall . . . . .	T. Viau & L. Lachance.	Aug. 10, 1900	16,000 00
HARBOURS AND RIVERS.			
<i>New Scotland.</i>			
Boulevard Centre—Construction of public wharf	J. B. McManus . . . . .	April 29, 1901	4,850 00
Ecum Secum—Construction of wharf . . . . .	Reid & Archibald . . . . .	Dec. 17, 1900	3,950 00
Gabarus—Construction of breakwater . . . . .	Hugh McDonald . . . . .	Sept. 5, 1900	7,882 00
Isaac's Harbour—Construction of wharf . . . . .	Reid & Archibald . . . . .	Nov. 2, 1900	3,975 00
Kempt Head—Construction of public wharf . . . . .	" " " " " " " " " " " "	April 30, 1901	4,980 00
Little Bras D'Or—Construction of wharf . . . . .	" " " " " " " " " " " "	May 7, 1901	5,930 00
<i>New Scotia.</i>			
Neil's Harbour—Construction of a breakwater . . .	John Heney & H. Smith.	May 29, 1901	16,600 00
Parker's Cove—Extension of wharf . . . . .	W. H. Anderson . . . . .	Aug. 27, 1900	800 00
Parrsboro'—Construction of wharf . . . . .	Reid & Archibald . . . . .	Nov. 2, 1900	8,775 00



1-2 EDWARD VII., A. 1902

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Continued.*

Works.	Names of Contractors.	Date of Contract.	Amount.
HARBOURS AND RIVERS— <i>Continued.</i>			\$ cts.
<i>Prince Edward Island.</i>			
New London—Reconstruction of portion of break-water, &c.....	T. P. Cullen....	June 18, 1901	5,493 00
Souris—Construction of protection slope of break-water.....	James Lanegan....	Nov. 2, 1900	Per c. y. 3 74
(1) Wood Islands—Extension of southern break-water.....	Alexander Compton....	Nov. 3, 1900	6,980 00
<i>New Brunswick.</i>			
Back Bay—Extension of wharf.....	John McGratton....	May 31, 1901	6,750 00
Bay du Vin—Reconstruction of public wharf....	Chas. Rainsborrow....	May 27, 1901	7,745 00
Black Brook—Construction of wharf.....	J. E. Simmons & D. C. Burpee.	Feb. 14, 1901	5,850 00
Hopewell Hill (Shepody River)—Construction of wharf.....	I. C. Prescott.....	Apl. 15, 1901	3,740 00
Hopewell Cape—Construction of wharf.....	Downey & Lynds....	Oct. 8, 1900	19,988 00
Point Wolfe—Construction of beach protection....	Jas. E. Simmons....	Apl. 5, 1901	2,960 00
Mispec—Construction of breakwater.....	Geo. A. Appleby.....	Feb. 13, 1901	10,900 00
St. John—Renewal of post office metal roof covering.....	Keenan & Ratchford....	Oct. 19, 1900	1,945 00
<i>Quebec.</i>			
Carleton—Additional length to wharf.....	John Heney & H. Smith.	Mch. 6, 1901	10,490 00
Grande Vallée Harbour—Construction of a landing pier.....		June 29, 1901	53,900 00
(2) Hull—Construction of concrete and masonry wharf.....	Michael O'Leary....	Oct. 30, 1900	44,850 00
Isle-aux-Grues—Construction of wharf.....	E. Dussault et L. Lemieux	Oct. 23, 1900	8,500 00
(3) Montreal—High Level Pier and two bulkheads in the Harbour of.....	J. C. Malone.....	July 25, 1900	631,033 33
Portage du Fort—Iron superstructure of a highway bridge.....	Berlin Iron Bridge Co....	Sept. 25, 1900	13,700 00
Rapides Des Joachims—Two stone piers and abutments for iron bridge.....	Keating, Wilson & Boucher.	Sept. 27, 1900	13,000 00
Rapides Des Joachims—Superstructure of an iron highway bridge.....	Dominion Bridge Co., Ltd.	Nov. 23, 1900	19,570 00
Sorel—Construction of a high level dock and dredging.....	McAuliff, Poupore, Malone & Weddell.	June 25, 1901	255,632 43
Sorel—Govt. Work Shop.—Supply of electrical material for lighting engine and dynamo..	'Royal Electric Co.' ..	July 5, 1900	2,488 51
<i>Ontario.</i>			
Collingwood—Dredging in the Harbour of.....	C. S. Boone....	May 28, 1901	34,000 00
Leamington—Construction of a wharf.....	John Flook....	Feb. 5, 1901	29,949 93
Meaford Harbour—Construction of a concrete wall.....	M. A. Pigott....	Oct. 31, 1900	5,202 78
Ottawa—Maria Street Bridge—Concrete iron floor	Roebling Construction Co.	Nov. 24, 1900	6,398 00
" " Construction of the superstructure.....	The Dominion Bridge Co., Ltd.	July 28, 1900	35,207 00
Ottawa—Chaudière Slide Channel—Superstructure of highway bridge.....	" "	Aug. 18, 1900	21,530 00
Owen Sound Harbour—Close piling west side of Schellam River.....	The Owen Sound Dredge and Construction Co., Ltd.	July 31, 1900	28,425 00

(1) This contract has been transferred to Horace Haszard on Feb. 13, 1901, and the transfer was ratified by His Majesty.

(2) This contract was assigned to Joseph Bourque on Oct. 30, 1900.

(3) Order in Council dated Dec. 24, 1900, granting authority to add the name of W. J. Poupore to that of J. C. Malone, said firm to be dealt with under the name of 'Poupore & Malone.'



## SESSIONAL PAPER No. 19

No. 1.—CONTRACTS let by the Department of Public Works, &c.—*Concluded.*

Works.	Names of Contractors.	Date of Contract.	Amount.
HARBOURS AND RIVERS— <i>Concluded.</i>			\$ cts
Ontario— <i>Concluded.</i>			
Pointe-au-Pele Island—Construction of a dock..	James Clark.	Oct. 26, 1900	7,440 00
Port Burwell—Dredging in the Harbour of ..	W. A. McGillis & Co.,	May 31, 1900	Per c. y. 0 12
*Port Colborne—Breakwater and rock excavation, 1,300 feet in length.....	Hogan & Macdonell....	Mch 14, 1901	150,000 00
Providence Bay—Construction of a wharf .....	Bowman & Porter.....	Aug. 27, 1900	7,500 00
Sarnia—Dredging in the Harbour.....	James O'Leary.....	Sept. 15, 1900	9,500 00
Sheguindah—Construction of pile wharf.....	Bowman & Porter..	Aug. 27, 1900	5,900 00
Wharton—Construction of a wharf.	G. Kastner & D. Porter.	Mch 7, 1901	13,320 00
Manitoba.			
St. Andrews Rapids, Red River—Masonry of proposed lock and dam... ..	Kelly Bros. & Co.	July 18, 1900	409,000 00
VESSELS, DREDGES AND PLANT.			
Construction of a cylindrical straightway boiler for dredge ..	John McDougall	Sept 28, 1900	3,360 00
" " " " ..	J. & W. R. Weir.	Oct. 1, 1900	3,360 00
Construction of an hydraulic sand dredge for Pacific Coast.....	The Polson Iron Works..	Oct. 19, 1900	91,515 00
Construction of an hydraulic sand dredge for Ship Channel.....		Apl. 12, 1901	163,800 00
Construction of discharge pipes and pontoons for hydraulic dredge ..		May 23, 1901	45,980 00
Construction of a boiler for dredge Canada.	New Burrell Johnson Iron Co., Ltd.	May 25, 1901	4,900 00
TELEGRAPH AND SIGNAL SERVICE			
Alberni to Cape Beale, B.C.—Maintenance of Telegraph Line.....	Geo. A. Huff.....	Nov. 14, 1900	Per m. 75 00
Golden to Windermere, B.C.—Supply of poles and construction of tel. line, 90 miles, more or less ..	G. P. Kelly & A. Walkly.	Dec. 10, 1900	P. mile 73 50
ROADS.			
Construction of a wagon road, from Williams Roadhouse to the mouth of Gold Run Creek, Yukon Territory ..	A. B. Palmer et al.,	July 27, 1900	For sec. No. 1 per mile, \$1,350. For sec. No. 2 per mile, \$1,400.

\* Contractors agreeing to execute the whole of the work, 5,700 feet for a sum of \$395,000.

J. A. CHASSE.

*Law Clerk.*

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, November 18, 1901.



1-2 EDWARD VII., A. 1902

No. 2. STATEMENT of properties purchased or sold by the Department of Public Works during the Fiscal Year ended 30 June, 1901.

Date of purchase	Vendors	Description of Property	For what purpose	Area	Price
1900					
July 14	B. C. Pelletier, ... M. Lock, McLeannan & Co.	Right of fishing and Sale of wharf & sheds at Port Findlay, Ont.	Govt. purposes		150 00
" 20		Bill of sale of Boom Spoon Dredge No. 6...	"		1,000 00
Aug. 3	Hon. Com. of Montreal	Bill of sale of Crane Spoon Dredge No. 7	"		5,000 00
" 3			"		1,000 00
" 7	Mrs. Louise Duckett	Sale of part of lot No. 191 of cadastre of the parish of Ste. Anne du Bout-de-Ville, P. Q.	"	2,300 square ft.	1,350 00
" 7	Alice Duckett	Sale of part of lot No. 192 of official cadastre of the parish of Ste. Anne du Bout-de-Ville, P. Q.	"		650 00
" 28	David J. Barker et al.	Sale of lot No. 265, Picton, Ont.	For public building		600 00
" 30	Jas. Sanderson et al.	Sale of land, lot No. 98, St. Andrews Rapids, Manitoba.	Proposed Lock & Dam.	11 1/2 of acre	30 00
Sept. 27	W. H. Meldrum et al.	Sale of parts of lots Nos. 7 and 8, Paris, Ont.	Site for pub. building	11,200 square ft.	2,400 00
Oct. 10	J. R. Gondolito et al.	Sale of north 1/2 of lot 12, block "F", Harper and Ladue addition, Yukon Territory	Site for pub. building		2,000 00
" 15	T. A. Pickington et al.	Land and wharf, part of lot No. 110, St. Nicholas, P. Q.	For wharf	82,220 square ft.	2,000 00
" 19	Town of Deseronto	Sale of part of lot 125, Block D, town of Deseronto.	Site for pub. building		Free Grant
" 26	G. E. Roy & J. Chartier	Lot of land, Ste. Catharine Street, Hochelaga, P. Q.	"	9,826 square ft.	7,300 50
" 29	Geo. F. Payne	Part of lot No. 253, Granby, P. Q.	"		2,500 00
" 29	G. & L. St. John Ry Co.	Piece of land, lot No. 317, Roberval, P. Q.	"		Don. en vifs
" 30	Corp. of Paris, Ont.	Conveyance of lot No. 8, west side of Grand River street, north of Smith's Creek, Paris, Ont.	"		
" 30	W. A. Ryan	Sale of part of lot 102, at Sabarvois, P. Q.	For right of way	10,560 square ft.	5 00
" 31	J. de la Harpe	Sale of lot No. 100, St. Andrews Rapids, Manitoba	For lock and dam	3 1/2 acres	500 00
" 31	J. de la Harpe	Sale of portion of lot No. 101, St. Andrews Rapids, Man.	"	2 1/2 acres	125 00
Nov. 1	G. Truthwante	Sale of parish lots 104 and 105, St. Andrews Rapids, Man.	"	2 1/2 acres	225 00
" 1	H. Lallie	Sale of part of lot No. 105, St. Andrews Rapids, Man.	"	3 acres more or less	150 00
" 1	S. A. E. McDonald	Sale of southerly 3/4 of lot No. 105, St. Andrews Rapids, Man.	"	1 acre	25 00
" 1	G. G. Gauthier	Sale of lot No. 165, St. Andrews Rapids, Man.	"	2 1/2 acres	150 00
" 1	Henry G. Gauthier	Sale of lot No. 164, St. Andrews Rapids, Man.	"	2 1/2 acres	115 00
" 26	Queen's College Kingston	Sale of land, lot No. 102, St. Andrews Rapids, Man.	"	2 1/2 acres	130 00
Dec. 6	Louis Drouin	Land, lot No. 11, Dolmas Township, Chateaufort, P. Q.	Govt. purposes	1 1/2 acres	100 00
1901.				2,400 square ft.	Don. en vifs
Jan. 4	Che des moulins à papier de Montreal John Johnson.	Sale of part of lot No. 86 and lot No. 1, St. Pierre de Sorel, P. Q.	Ship yard		8,000 00
Feb. 1		Sale of N. E. quarter of sect. 25, Township, 25, Range, 6, Grall Harbour, Man.	For approach to wharf	1 acre	1 00
" 14	N. Am. Transp. Co. Ltd.	Bill of sale of Jesse Hume	Govt. purposes		11,500 00
" 22	Domin. Savings & Invest. ment Society	Sale of parts of lots Nos. 4 and 5, south side of East Dundas St., London, Ont.	For drill shed		1,000 00
Mar. 8	H. J. Bennett et al.	Sale of land, Hopewell Cape, N. B.	For wharf	1 1/2 acres	85 00
" 13	Alex. Favors et al.	Sale of land and premises, Chatham, N. B.	"	2,017 square ft.	1,200 00
June 19	City of St. John, N. B.	Sale of land, west side of Harbour, St. John, N. B.	For innng. building	9,160 square ft.	1 00



SESSIONAL PAPER No. 19

No. 3. STATEMENT of properties leased to and by the Department of Public Works during the fiscal year ended June 30, 1901.

Date of Lease.	Lessors		Property Leased.	For what purpose.	Duration of Lease.	Annual Rental.
1900.						
Aug. 14	Ann Louise Bender.	Her Majesty	Ground floor of store 117 King street West, Toronto.	For mail purposes.	5 years	\$ 750 00 per annum
Sept. 20	Merchants Bank of Canada	"	Rooms Merchants Bank Building, Montreal, P.Q.	For P. W. Dept	2 "	700 00 "
Oct. 1	Molson's Bank	"	1st and 2nd flats of building, west side of Metcalfe street, Ottawa.	For Labour Dept	5 "	1,200 00 "
" 3	Her Majesty	Bromson Co	Portion of Ameha Island, Ottawa, 7,500 sq. ft.	"	During pleasure.	100 00 "
" 31	"	Wm. Ritchie	Piece of land, St. Christopher Island, P.Q.	Private enterprise	"	100 00 "
1901.						
March 5	Ottawa Building Co., Ltd	His Majesty	Building 66 x 52 ft., corner of Metcalfe and Slater streets, Ottawa.	For Interior Dept.	10 years	3,000 00 "
April 19	Mrs. Mary Wright	"	Lease of building Wellington St., Ottawa.	Govt. Workshop	5 "	600 00 "
" 19	R. N. Slater et al.	"	Premises No. 172 Wellington St., Ottawa.	For N.W.M.P. store	5 "	540 00 "
May 1	Robert E. Finn	"	Lease of 88, <i>Toronto</i>	Dredging purposes	6 months	1,600 00 per month.
" 15	Ottawa Building Co., Ltd	"	Premises Nos. 98 and 100 Wellington street, Ottawa.	For Customs purposes	10 years	1,500 00 per annum
June 1	His Majesty	Frontenac Milling Co., Ltd	Portion of Kingston Graving Dock, 40 x 72 ft.	Private enterprise.	5 "	1 00 "
" 8	"	Chs. L. Gass	Water lot, Bayfield, N.S., 5,224 sq. ft.	"	During pleasure.	1 00 "
" 13	R. N. Slater et al	His Majesty	Addition to premises 172 Wellington street Ottawa.	For N.W.M.P. store	5 years	600 00 "

This lease was assigned to the Union Bag & Paper Coy. on May 20, 1901. Confirmed by OC dated April 13, '01.

DEPARTMENT OF PUBLIC WORKS,  
OTTAWA, November 18, 1901.

J. A. CHASSE.  
*Law Clerk.*







# NATIONAL ART GALLERY

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## CURATOR'S REPORT

FOR THE FISCAL YEAR ENDED JUNE 30, 1901







NATIONAL ART GALLERY.

CHIEF ARCHITECT'S OFFICE,  
OTTAWA, December 5, 1901.

SIR,—I have the honour to report that the following addition has been made to the Gallery during the fiscal year ending June 30, 1901.

'Habitant Ploughing,' by Chas. Huot, Esq., purchased by the government for \$500.

Seventeen thousand six hundred and seventy-three visitors registered during the year, being an increase of over three thousand from preceding year.

I have the honour to be, sir,

Your obedient servant,

L. FENNING TAYLOR,  
*Curator.*

FRED. GELINAS, Esq.,  
Secretary, Dept. of Public Works.







NAMES OF THE CHIEF OFFICERS  
OF THE  
DEPARTMENT OF PUBLIC WORKS  
WITH  
DATES OF APPOINTMENT, ETC., FROM 1841 TO 1901







NAMES OF THE CHIEF OFFICERS.

The names with the dates of the appointment, &c., of the principal Officials of the Department of Public Works, from 1841 to 1901.

Names.	Capacity or Office.	Date of Appointment Served.	
		From	To
<i>Under Statute 4<sup>th</sup> Vic., Cap. 28.</i>			
CORPORATION BOARD OF WORKS.			
Killaly, Hon. H. H. ....	Chairman		
Daly, Hon. D .	Members	Dec	29, 1841
Harrison, S. B. ....		Oct.	3, 1844
Sullivan, R. B. ....			
Davidson, J., Esq. ....			
Begly, Thomas A .	Secretary .....	Aug.	17, 1841
Keefer, Samuel...	Chief Engineer .....	"	17, 1841
Rubidge, F. B. .	Architect and Assistant Chief Engineer ..	Dec.	15, 1841
NEW BOARD OF WORKS			
Killaly, Hon. H. H.	Chairman.		
Daly, Hon. D	Members	Oct	4, 1844
Draper, Hon. W. H.		June	8, 1846
Morris, Hon. W			
Papineau, Hon. D. B.			
<i>Under Statute 9<sup>th</sup> Vic., Cap. 37, &amp;c.</i>			
Robinson, Hon. W. B	Chief Commissioner. ....	June,	22, 1846
Taché, Hon. E. P. ....		March	11, 1848
Chabot, Hon. J. .		Dec.	13, 1849
Merritt, Hon. W. H		April	8, 1850
Bourret, Hon. J. .		Feb.	12, 1851
Young, Hon. John.		Oct.	28, 1851
Chabot, Hon. J .		Sept.	23, 1852
Lemieux, Hon. F		Jan.	27, 1855
Alleyn, Hon. C .		Nov.	26, 1857
Holton, Hon. L. H. .		Aug.	2, 1858
Sicotte, Hon. L. V. ....		"	7, 1858
Rose, Hon. John .		Jan.	11, 1859
Cauchon, Hon. Jos. ....	Commissioner. ....	June	13, 1861
Tessier, Hon. U. J. ....		May	24, 1862
Drummond, Hon. L. T. ....		"	28, 1863
Laframboise, Hon. M. ....		July	24, 1863
Chapais, J. C. ....		March	30, 1864
Casgrain, Hon. Chas. Eus	Second Commissioner.	July	9, 1846
Cameron, Hon. M. .	Assistant Commissioner	March	11, 1848
Westenhall, John S., Esq. .	"	Feb.	2, 1850
Bourret, Hon. Jos. . . .	"	April	17, 1850
Killaly, Hon. H. H. ....	"	Feb.	12, 1851
Keefer, Samuel. . . . .	Deputy Commissioner.	May	6, 1859
Trudeau, Toussaint. ....		March	8, 1864
Begley, Thos. A. ....	Secretary .....	Feb.	10, 1841
Trudeau, Toussaint. ....	"	Dec.	13, 1859
Braun, Frederick. ....	"	March	8, 1864
Page, John. ....	Chief Engineer.	Oct.	31, 1853



1-2 EDWARD VII., A. 1902

The names with the dates of the appointment, &c., of the principal Officials of the Department of Public Works, from 1841 to 1901.—*Continued.*

		Date of Appointment Served.			
Names.	Capacity or Office.	From		To	
<i>Under Statute 31 Vic., Chap. 12.</i>					
McDougall, Hon. Wm.....	Minister..	July	1, 1867	Dec.	7, 1869
Langevin, C.B., Hon. Hector L.....	"	Dec.	8, 1869	Nov.	6, 1873
Mackenzie, Hon. Alexander.....	"	Nov.	7, 1873	Oct.	16, 1878
Tupper, C.B., K.C.M.G., Sir Charles....	"	Oct.	17, 1878	May	19, 1879
Langevin, C.B., K.C.M.G., Sir Hector L.	"	May	20, 1879	Aug.	11, 1891
Smith, Hon. Frank.....	Acting Minister	Aug.	14, 1891	Jan.	10, 1892
Ouimet, Hon. Joseph Aldéric.....	Minister..	Jan.	11, 1892	April	30, 1896
Desjardins, Hon. Alphonse.....	"	May	1, 1896	July	12, 1896
Tarte, Hon. J. Israel.....	"	July	13, 1896		
Trudeau, Toussaint.....	Deputy Minister....	May	29, 1868	Oct.	1, 1879
Baillargé, G. F.....	"	Oct.	4, 1879	Dec.	31, 1890
Gobeil, A. ....	"	Jan.	1, 1891		
Braun, Frederick.....	Secretary	July	1, 1867	Sept.	30, 1879
Chapleau, S. ....	"	Oct.	1, 1879	Nov.	4, 1880
Ennis, F. H. ....	"	Nov.	5, 1880	Jan.	13, 1885
Gobeil, A.....	"	Jan.	23, 1885	Dec.	31, 1890
Roy, E. F. E.....	"	"	1, 1891	"	31, 1900
Gelinas, Fred ..	"	June	8, 1901		
McPherson, D. A. ....	Assistant Secretary.	Jan.	18, 1891	April	11, 1893
Desrochers, Rudolphe Charles.....	"	"	8, 1896		
Page, John. ....	Chief Engineer....	July	1, 1868	Oct.	1, 1879
Perley, H. F. ....	"	Nov.	25, 1880	July	10, 1891
Baillargé G. F... ..	Assistant Chief Engineer.	July	5, 1871	"	4, 1879
Coste, Louis.....	Chief Engineer.....	"	26, 1892	March	18, 1899
Lafleur, E. D. ....	Acting Chief Engineer ...	March	18, 1899		
Scott, Thos. S.....	Chief Architect.....	May	26, 1871	Oct.	30, 1881
Fuller, Thomas.....	"	Oct.	31, 1881	June	30, 1897
Ewart, David ..	"	Nov.	2, 1897		



NAMES  
OF THE  
OFFICIALS EMPLOYED ON THE SLIDES AND BOOMS OF CANADA  
ON JUNE 30, 1901  
WITH  
DATES OF APPOINTMENT, SALARIES, ETC.



1-2 EDWARD VII., A. 1902

OFFICIALS EMPLOYED ON THE SLIDES AND BOOMS.

STATEMENT showing the Names, Dates of Appointment, Salaries, &c., of persons employed on the various Slides and Booms, on June 30, 1901.

NAME.	Date of Birth.	Position.	Where employed.	Date of Appointment.	Salary.	Remarks.
<i>Collector of Slide and Boom Dues.</i>						
E. T. Smith	Nov. 26, 1846.	Collector	Ottawa	July 1, 1889.	1,800 00 a year	Date of first appointment to Crown timber office, Ottawa, June 23, 1864. Clerk, Dept. of Inland Rev., July 1, 1870, to June 30, 1889. Transferred to civil list with rank of first class clerk, January 6, 1892.
F. X. Gagne James Steen	Sept. 23, 1859	Clerk	"	Dec. 16, 1897.	1,003 75 a year	Entered the service August 13, 1889
	June 17, 1830	Boatman	"	July 12, 1889.	60 00 a month	Employed during the season of navigation, for 8 months each year. Date of first appointment, May 26, 1861. Timber cutter, Ottawa, for Dept. of Inland Revenue, Jan. 7, 1884, to June 30, 1889.
J. Brassard		Boatman	"	March 1, 1901	60 00 a month.	Employed during the season of navigation, for 8 months each year. Date of first appointment, May 1, 1872. Assistant timber cutter, Ottawa, for Dept. of Inland Revenue, Jan. 7, 1884, to June 30, 1889.
<i>Saguenay District</i>						
Saguenay district slides abandoned by authority of O. C., dated Feb. 5, 1896 (No. 168,740).						
<i>St. Maurice District</i>						
L. P. Dallaire		Paymaster	Three Rivers	May 1, 1898.	66 66 a month.	
Cyriae Lymburner	1833.	Boom master	Grand Mere	April 25, 1881.	75 00 "	
Jos. Page	July 7, 1845.	Slide	Mt. of St. Maurice.	Dec. 10, 1879.	75 00 "	
Jos. Dick		Asst.	Capony Cornelles	May 19, 1898.	75 00 "	
Gedon Roussau		"	Shawenigan & Gros.	April 7, 1896	75 00 "	
Morse Masson		Boom keeper	Grand's Piles	May 19, 1898.	75 00 "	



## SESSIONAL PAPER No. 19

<i>Ottawa District</i>	Date	Position	Place	Superintendent	City	Date	Salary	Remarks
G. P. Brophy	Feb. 24, 1846	Superintendent	Ottawa		July 6, 1873	2,500 00 a year		<i>Ottawa River Works</i> In addition to the above officers, &c., there are employed during the running season, one foreman on slide at \$1.50 and one assistant foreman at \$1.25 a day; also 25 to 30 labourers at from \$1 to \$1.40 a working day. Oversees repairs in winter.
D. Scott	" 15, 1830	Accountant	"		Oct 1, 1854	1,500 00 "		"
J. C. Scott	June 27, 1865	Measurer	"		April 1, 1889	3 50 a day		"
J. Kent	Jan. 28, 1864	Clerk	"		Aug 1, 1886	3 25 "		
Wm. Gam	April 22, 1860	Messenger	"		Jan. 1, 1892	1 35 "		
Pierre St. Pierre		Deputy slide master	Carillon		June 1, 1897	1 40 "		Actively employed about 7 months. Oversees repairs in winter.
D. Noonan	June 17, 1840	Boom master	Gatineau		Mar. 21, 1878	500 00 a year		"
J. Soudière	Nov. 8, 1829	Deputy slide master	Chaudière		1878	2 50 a day		"
P. D. Chene		"	Hull		June 14, 1899	1 50 "		Employed about 6 months.
W. A. Sheriff	May 22, 1831	Slide master	Chats		April 26, 1898	1 50 "		" Oversees repairs in winter.
John Harvey	Mar. 26, 1869	Boom master	Amprior		July 12, 1882	2 50 "		Actively employed about 7 months.
Joseph McCrea	" 27, 1858	Slide master	Springtown		May 15, 1880	300 00 a year		Employed about 3 months during season of navigation.
Patrick Barry	Jan. 7, 1860	Deputy slide master	Portage du Fort		Sept. 7, 1881	450 25 a year		Employed 5 months during season of navigation. Oversees repairs in winter.
Duncan McLaren		"	Black River			480 00 "		"
D. Rochon		"	Lower Petawawa			2 00 a day		"
Wm. Selkirk		"	Upper Petawawa			2 00 "		"
P. O'Connor	May 3, 1843	"	Mountain		Mar. 18, 1898	1 25 "		" 6 mos.
Wm. Thompson		"	Calumet		Oct. 10, 1879	30 00 a month		" 6 to 7 mos
S. Moorhead		"	Conlonge		Mar. 1, 1901	300 00 a year		" 4 mos.
John Mullin		"	Des Joachims		April 10, 1899	300 00 "		"
H. R. Downey	May 16, 1846	"	Dunsmuir		July 1, 1889	300 00 "		"
J. F. McGuire		"			May 1, 1897	300 00 "		Employed 3 months during season of navigation. Will inspect works when required.
J. J. French		"	Crooked Chute			2 00 a day		"
J. W. Carmichael		"	Rocher Capitanie		Dec. 24, 1896	2 00 "		"
A. H. Johnson	Nov. 28, 1839	"	Chenouix		1865	2 50 "		Paid during season of navigation, 7 mos
G. T. Johnson	Sept. 10, 1841	"			1872	1 75 "		Attends to repairs in winter.
<i>Newcastle District</i>								
S. Clegg		Superintendent	Peterborough		Mar. 1, 1901	800 00 a year		Receives \$800 a year from Department of Railways and Canals.
G. H. Garonx		Clerk, Supt's Office	Peterborough		" 1, 1880	400 00 "		" 8400 "
R. A. Wagon		Slide master	Chisholm Rapids		June 15, 1898	200 00 "		"
W. T. Junkin		"	Fenelon Fall		Nov 15, 1896	100 00 "		\$250 a year as lock master, Dept. R. & C.
R. T. Hall		"	Buckhorn		July 1, 1891	100 00 "		Receives \$150 a year from Department of Railways and Canals.
Hamilton Johnston		"	Healey's Falls		" 15, 1893	200 00 "		
John Dinwoody		"	Lakefield		June 20, 1893	150 00 "		
<i>Richmond District</i>								
C. Choquette		Boom master	Bois Station		July 26, 1897	100 00 "		



STATEMENT showing Names, Age, of persons employed on the various Slides and Booms *Concluded.*

Name	Date of Birth.	Position	Where Employed.	Date of Appointment	Salary.	Remarks.
<i>Burlington Canal.</i>						
<i>Stony Bridge.</i>						
Wm. O'Brien.		Bridge attendant.	Burlington.	Sept. 19, 1896.	2	
R. Fletcher.		" assistant.	"	July 1, 1899.	600 00 a year.	
C. Kesherry.		"	"	Sept. 19, 1896.	1 25 a day.	Employed 9 months.
Jos. Finster.		"	"	" 19, 1896.	1 25 "	"
<i>Yamaska District.</i>						
H. Lambert.		Lock keeper.	Yamaska.	July 1, 1897.	40 00 a month.	
O. Minon.		"	"	Sept. 1, 1885.	40 00 "	
<i>Rivière du Loup.</i>						
Hugh Gorman.		Lock master.	Rivière du Loup.	April 15, 1897.	40 00 "	
James Brazier.		Labourer.	"	" 15, 1897.	35 00 "	

JOS. VINCENT.



NAMES  
OF  
PERSONS EMPLOYED ON THE VARIOUS GRAVING DOCKS  
ON JUNE 30, 1901  
WITH  
DATES OF APPOINTMENT SALARIES, &c.



1-2 EDWARD VII., A. 1902

GRAVING DOCK EMPLOYEES.

STATEMENT showing the Names, Dates of Appointments, Salaries, &c., of Persons employed on the various Graving Docks, June 30, 1901.

Name.	Position.	Where Employed.	Date of Appointment.	Salary.	Remarks.
<i>Esquimaux Graving Dock, British Columbia.</i>					
John Devereux	Dockmaster.	Esquimaux	Sept. 17, 1887.	\$ 166 66 a month.	
John Joffcott.	Engineer	"	Jan. 4, 1901	100 00 "	
H. N. Jones	Assistant engineer	"		80 00 "	
A. D. Graves.	Stoker	"	Dec. 1, 1887	80 00 "	
F. M. Jones	Stoker	"	July 1, 1890	60 00 "	
T. Collins	Stoker	"		60 00 "	
Chas. Jordan	"	"		60 00 "	
G. Springer	Watchman	"		50 00 "	
John Stock	Labourer	"	July 1, 1894	50 00 "	
<i>Levis Graving Dock.</i>					
Alf. Samson.	Dockmaster.	Levis	Feb. 15, 1900.	1,000 00 a year.	
Wm. Macdonnell.	Mechanical engineer	"	June 1, 1888.	75 00 a month	
T. Guibault	Asst. mechanical engineer	"	Sept. 1, 1897	45 00 "	
Narcisse Lemelin.	Fireman	"	June 1, 1888	32 00 "	
<i>Kingston Graving Dock.</i>					
F. S. Rees.	Dockmaster.	Kingston	April 1, 1897	1,000 00 a year	
Robert McLeod	1st engineer	"	July 1, 1892	75 00 a month	
Wm. Goughan	Fireman	"	" 1, 1892	45 00 "	
C. Staley	Watchman.	"	" 1, 1892	45 00 "	

JOS. VINCENT.



LIST  
OF  
ENGINEERS, ENGINEMEN, FIREMEN AND CARETAKERS  
EMPLOYED  
IN THE PUBLIC BUILDINGS THROUGHOUT THE DOMINION  
ON JUNE 30, 1901  
GIVING  
DATES OF APPOINTMENT, SALARIES ETC.



1-2 EDWARD VII., A. 1902

ENGINEERS AND CARETAKERS, PUBLIC BUILDINGS.

STATEMENT showing the Names, &c., of the Engineers, Fireman, Caretakers, Hoist Attendants and Watchmen employed at Dominion Public Buildings on June 30, 1901.

Place.	Building.	Name.	Date of Birth.	Position.	Date of Appointment.	Monthly Salary.	Time employed each Year.	Yearly Salary.
						\$. cts.		\$. cts.
Amherst.	Post office.	J. H. Chapman.	Jan. 1, 1846	Caretaker.	Sept. 1, 1900	33 33	12 months.	400 00
Antigonish.	Public building.	Angus McDonald.	Mar. 1829	"	Feb. 5, 1891	33 33	12 "	400 00
Annapolis.	Post office and custom house.	John McKay.	Oct. 26, 1847	"	April 1, 1891	33 33	12 "	400 00
Bathurst.	Public building.	D. F. McKenzie.	May 20, 1848	"	Jan. 21, 1899	16 67	12 "	200 00
Dartmouth.	"	L. C. Henley.	Dec. 11, 1846	"	May 22, 1894	20 83	12 "	250 00
Halifax.	Dominion building.	Richard Power.	Aug. 5, 1834	Engineer.	Oct. 1, 1871	62 50	12 "	750 00
"	"	John Powell.	" 21, 1836	Fireman.	" 1, 1871	50 00	8 "	400 00
"	"	J. F. Sullivan.	April 16, 1866	Caretaker.	July 1, 1892	33 33	12 "	400 00
"	"	W. H. Gray.	Nov. 26, 1848	Watchman.	Sept. 10, 1891	30 00	12 "	468 00
"	Drill hall.	R. Harmon.	Dec. 23, 1868	Fireman.	Dec. 3, 1898	50 00	12 "	600 00
"	Examining warehouse.	M. O'Neil.	" 30, 1850	Caretaker.	Oct. 1, 1897	33 33	12 "	400 00
"	Immigrant building.	John Oxley.	April 17, 1856	Fireman.	Feb. 2, 1897	50 00	12 "	600 00
"	Public building.	W. Hiltz.	" 4, 1864	Caretaker.	Nov. 14, 1900	33 33	12 "	400 00
Kentville.	"	James Clements.	June 5, 1835	"	June 20, 1900	33 33	12 "	400 00
Liverpool.	"	J. E. Hobbs.	Nov. 3, 1833	"	" 7, 1895	25 00	12 "	300 00
Lunenburg.	"	J. A. Mutch.	Dec. 12, 1840	"	Oct. 3, 1901	25 00	12 "	300 00
New Glasgow.	Post office.	Alex. Green.	July 16, 1825	"	" 1, 1897	20 16	12 "	350 00
North Sydney.	Public building.	Jas. Arbutnot.	Feb. 18, 1836	"	Dec. 20, 1896	20 16	12 "	350 00
Pictou.	Post office and custom house.	L. Keefe.	May 5, 1846	"	Nov. 1, 1897	33 33	12 "	400 00
Sydney South.	"	Alex. P. Smith.	" 17, 1837	"	April 1, 1897	20 16	12 "	350 00
Truro.	"	J. A. Mosher.	Nov. 16, 1841	"	Feb. 13, 1899	33 33	12 "	400 00
Windsor.	Public building.	W. H. Whallon.	Dec. 23, 1847	"	Mar. 1, 1900	33 33	12 "	400 00
Yarmouth.	Dominion building.	Wm. J. Fraser.	Jan. 1, 1836	" & fireman.	April 3, 1894	33 33	12 "	400 00
Charlottetown.	"	Geo. Walker.	Aug. 28, 1826	Messenger.	Jan. 19, 1875	41 06	12 "	493 00
"	"	M. A. Allan.	Jan. 8, 1855	"	" 24, 1898	37 50	12 "	450 00
"	"	Angus McKenzie.	Mar. 12, 1836	Watchman.	Nov. 1, 1896	33 33	12 "	400 00
Montague.	Public building.	W. Gillis.	Oct. 25, 1835	Caretaker.	May 9, 1898	13 33	12 "	160 00
Summerside.	Dominion building.	A. MacSween.	Sept. 20, 1825	"	Sept. 1, 1897	33 33	12 "	400 00
Bathurst.	Post office.	J. A. Melancon.	Jan. 18, 1856	"	April 13, 1887	33 33	12 "	400 00
Chatham.	"	C. Johnston.	May 15, 1823	"	Mar. 27, 1895	25 00	12 "	300 00
Charlton, St. John.	"	James R. Reid.	Aug. 1, 1853	"	Oct. 1, 1889	8 33	12 "	100 00
Dalhousie.	"	Wm. Gould.	Jan. 18, 1843	"	Nov. 26, 1890	33 33	12 "	400 00
Fredericton.	Post office.	James Perkins.	Dec. 11, 1832	Caretaker.	July 1, 1900	33 33	12 "	400 00
Moncton.	"	E. B. Hicks.	Jan. 11, 1832	"	Jan. 11, 1886	33 33	12 "	400 00



## SESSIONAL PAPER No. 19

New South West	Post office	Public building	Caretaker	Date of appointment	Date of termination	Length of service	Salary	Gratuities	Total
Patrick Keating	Post office	Public building	March 13, 1840	Oct. 23, 1846	33 33	12	400 00		400 00
Neil J. Morrison	Post office	Public building	July 25, 1848	April 27, 1894	66 00	12	720 00		720 00
Christopher White	Post office	Public building	Nov. 20, 1844	Nov. 9, 1856	50 00	12	600 00		600 00
James A. Paul	Post office	Public building	Aug. 1, 1837	Oct. 13, 1891	41 67	12	500 00		500 00
James Wolf	Post office	Public building	March 10, 1830	Dec. 1, 1893	55 00	12	660 00		660 00
Edward Haney	Post office	Public building	Feb. 22, 1849	Nov. 27, 1891	50 00	12	600 00		600 00
Samuel Topping	Post office	Public building	April 2, 1839	May 23, 1897	53 33	12	640 00		640 00
Mrs. N. Dryden	Post office	Public building	June 21, 1840	March 26, 1901	16 66	12	200 00		200 00
Charles Stratton	Post office	Public building	Jan. 20, 1839	May 1, 1897	33 33	12	400 00		400 00
Miss M. C. Woods	Post office	Public building	May 16, 1860	April 29, 1895	5 00	12	60 00		60 00
J. Ralston	Post office	Public building	Nov. 16, 1839	Nov. 15, 1899	33 33	12 months	400 00		400 00
Israel Baldwin	Post office	Public building	Dec. 1, 1843	Nov. 2, 1897	25 00	12	300 00		300 00
Z. Raymond	Post office	Public building	Dec. 1, 1843	March 8, 1900	12 50	12	150 00		150 00
A. Ratel	Post office	Public building	Sept. 7, 1846	Sept. 1, 1897	33 33	12	400 00		400 00
P. O. Robert	Post office	Public building	Aug. 8, 1848	Jan. 26, 1899	8 33	12	100 00		100 00
A. Thomas	Post office	Public building	June 24, 1836	Nov. 13, 1894	1 16	12	50 00		50 00
J. Desparre	Post office	Public building	June 18, 1836	June 25, 1894	100 00	12	1,200 00		1,200 00
Thomas Ryan	Post office	Public building	April 14, 1837	Dec. 3, 1894	41 67	12	500 00		500 00
Ed. Lanctot	Post office	Public building	Feb. 18, 1848	March 4, 1892	50 00	12	600 00		600 00
M. Boyer	Post office	Public building	Dec. 6, 1866	Dec. 4, 1894	45 00	8	360 00		360 00
N. Loiseleur	Post office	Public building	Oct. 4, 1837	Jan. 1, 1895	60 00	12	720 00		720 00
P. Green	Post office	Public building	Jan. 25, 1861	June 1, 1885	75 00	12	900 00		900 00
L. D. Thibault	Post office	Public building	Dec. 13, 1867	Jan. 7, 1895	60 00	12	720 00		720 00
G. S. Gaudet	Post office	Public building	Feb. 19, 1862	Sept. 10, 1894	50 00	12	600 00		600 00
Oscar Renaud	Post office	Public building	July 25, 1867	Dec. 13, 1893	50 00	12	600 00		600 00
Ant. Forget	Post office	Public building	Dec. 25, 1871	March 1, 1894	55 00	12	660 00		660 00
S. N. Nichol	Post office	Public building	May 17, 1842	Feb. 6, 1861	1 25 p. d.	12	456 25		456 25
C. Vachon	Post office	Public building	Feb. 2, 1863	Dec. 15, 1893	2 40 p. d.	12	730 00		730 00
J. Pichon	Post office	Public building	Sept. 17, 1840	Dec. 1, 1892	50 00	12	600 00		600 00
Louis St. Jean	Post office	Public building	June 19, 1843	July 2, 1882	45 00	12	540 00		540 00
H. Marchand	Post office	Public building	Nov. 20, 1861	Nov. 23, 1896	29 16	12	350 00		350 00
C. Dandelin	Post office	Public building	April 4, 1867	Feb. 14, 1899	50 00	12	600 00		600 00
B. J. J. J. J.	Post office	Public building	Nov. 20, 1861	Jan. 1, 1900	45 00	12	540 00		540 00
J. Gagnier	Post office	Public building	Nov. 20, 1861	April 1, 1897	75 00	12	900 00		900 00
A. James	Post office	Public building	Feb. 9, 1863	Aug. 26, 1892	53 33	12	640 00		640 00
D. P. Kennedy	Post office	Public building	Aug. 25, 1871	Nov. 1, 1894	45 00	12	540 00		540 00
T. P. McLaughlin	Post office	Public building	Nov. 1, 1848	Nov. 10, 1888	45 00	12	540 00		540 00
James O'Neil	Post office	Public building	Feb. 25, 1836	Sept. 1, 1897	55 33	12	660 00		660 00
John R. Mounton	Post office	Public building	July 8, 1856	June 25, 1896	50 00	12	600 00		600 00
J. Roy	Post office	Public building	July 14, 1869	Jan. 1, 1901	12 50	12	150 00		150 00
F. J. Cooper	Post office	Public building	Aug. 6, 1848	May 1, 1898	20 83	12	250 00		250 00
A. Leprieux	Post office	Public building	Jan. 22, 1848	April 2, 1898	33 33	12	400 00		400 00
H. Denarais	Post office	Public building	May 25, 1857	Sept. 1, 1897	33 33	12	400 00		400 00
O. Desève	Post office	Public building	Nov. 8, 1846	March 4, 1896	33 33	12 months	400 00		400 00
C. Robitaille	Post office	Public building	Jan. 21, 1849	Aug. 3, 1893	29 16	12	350 00		350 00
A. C. A. Bissonette	Post office	Public building	Oct. 24, 1839	Sept. 1, 1900	29 16	12	350 00		350 00
F. N. T. T.	Post office	Public building							
L. Fontaine	Post office	Public building							
J. Savard	Post office	Public building							



1-2 EDWARD VII., A. 1902

STATEMENT showing the Names, Ac., of the Engineers, Firemen, Caretakers, Hoist Attendants and Watchmen employed at the Dominion Public Buildings, Ac. *Continued.*

Place.	Building.	Name.	Date of Birth.	Position.	Date of Appointment.	Monthly Salary.	Time employed each Year.	Yearly Salary.	
						\$	cts.	\$	cts.
Toronto Rivers	P.O.	Ph. Gravelle	Oct. 3, 1828	Caretaker.	Feb.	25 00	12 months	300 00	
"	Custom house.	A. Gauthier	Feb. 4, 1850	"	"	33 33	12 "	400 00	
Victoriaville	"	Miss Eva Beaudet	July 28, 1867	"	May	6 25	12 "	75 00	
Ancherstburg	Ont.	R. Elliott	Aug. 22, 1835	"	"	33 33	12 "	400 00	
Albion	"	Wm. Moulton	March 23, 1830	"	Jan.	33 33	12 "	400 00	
Amherst	"	R. B. McCreary	Jan. 11, 1862	"	March 15, 1899	33 33	12 "	400 00	
Brookville	"	H. Purvis	Sept. 12, 1826	"	Dec.	33 33	12 "	400 00	
Brantford	"	John Squire	April 24, 1842	"	Oct.	50 00	12 "	600 00	
Brimley	"	R. D. Hall	Nov. 1, 1857	"	June 26, 1896	33 33	12 "	400 00	
Bellefleur	"	S. Haight	May 8, 1857	"	Jan.	50 00	12 "	600 00	
Berlin	"	J. C. Lemens	June 21, 1840	"	May 15, 1900	33 33	12 "	400 00	
Brampton	"	James McBride	Oct. 5, 1840	"	Jan.	33 33	12 "	400 00	
Charlton Place	"	Jas. P. Halfpenny	April 17, 1835	"	May 13, 1892	25 00	12 "	300 00	
Chatham	"	W. W. Mitchell	May 25, 1848	"	Jan.	33 33	12 "	400 00	
Chenoweth	"	R. Courty	Nov. 6, 1848	"	April 1, 1897	33 33	12 "	400 00	
Cayuga	"	G. A. Gibson	May 29, 1861	"	Sept. 3, 1891	4 16	12 "	50 00	
Cobourg	"	John Boyd	Dec. 9, 1836	"	Aug. 1, 1901	33 33	12 "	400 00	
Dundas	"	Wm. Graham	" 5, 1853	"	July 1, 1898	4 16	12 "	50 00	
Galt	"	Wm. Kilgour	March 3, 1857	"	Sept. 23, 1886	33 33	12 "	400 00	
Guelph	"	R. McLeod	July 30, 1865	"	May 25, 1901	33 33	12 "	400 00	
Granby	"	T. P. Richardson	Feb. 25, 1834	"	" 1, 1899	"	12 "	"	
Godfrich	"	G. Bissett	April 14, 1851	"	Sept. 1, 1897	29 16	12 "	350 00	
Hamilton	"	Alfred Barnard	Dec. 27, 1847	"	Dec. 10, 1894	50 00	12 "	600 00	
"	Domimon building	J. Wigglesworth	Aug. 7, 1863	Fireman.	Oct. 1, 1896	50 00	8 "	400 00	
"	"	Thos. Nicholson	Dec. 17, 1857	Engineer.	March 2, 1897	55 00	12 "	660 00	
"	Drill hall	H. Morris	Sept. 25, 1849	Fireman.	Dec. 6, 1897	45 00	8 "	360 00	
Ingersoll	"	John McDonald	June 30, 1841	Caretaker.	Nov. 20, 1900	33 33	12 "	400 00	
Kingston	"	Wm. F. Cozlett	May 27, 1854	Engineer.	" 20, 1900	65 00	12 "	780 00	
"	"	M. Melden	Dec. 22, 1838	Fireman.	Oct. 12, 1875	55 00	12 "	660 00	
London	"	M. Mulken	Sept. 4, 1837	Engineer.	Sept. 18, 1887	50 00	12 "	600 00	
London	"	Wm. Green	Oct. 12, 1839	Caretaker.	March 16, 1884	33 33	12 months	400 00	
"	"	John Price	" 6, 1836	Engineer.	Jan. 14, 1884	50 00	12 "	600 00	
Landsey	"	Wm. Galbraith	Jan. 8, 1844	Caretaker	Nov. 16, 1893	33 33	12 "	400 00	
Napanee	"	Mrs. C. E. Webster	July 12, 1846	"	Oct. 4, 1901	33 33	12 "	400 00	
Niagara Falls	"	Wm. J. Sheppard	Jan. 4, 1854	"	Jan. 15, 1897	33 33	12 "	400 00	
Orangeville	"	D. McPherson	April 30, 1851	"	July 15, 1900	33 33	12 "	400 00	
Orillia	"	John Prawley	March 14, 1844	"	Nov. 1, 1898	15 00	12 "	180 00	



## SESSIONAL PAPER No. 19

Port Hope	John Brown	May 17, 1842	"	June 8, 1885	25 00	12	300 00
Port Hope	Wm. Taylor	Nov. 25, 1839	"	Jan. 26, 1889	25 00	12	300 00
Port Hope	Chas. McRatchie	March 29, 1833	"	Feb. 1, 1894	33 33	12	400 00
Port Hope	Wm. Armstrong	Sept. 9, 1846	"	June 11, 1888	20 00	12	240 00
Port Hope	Levi Reynolds	Feb. 15, 1839	"	Nov. 17, 1885	33 33	12	400 00
Port Arthur	John Whitehead	April 15, 1839	"	Sept. 11, 1893	25 00	12	300 00
Pembroke	Samuel Hamilton	June 4, 1834	"	Oct. 29, 1890	33 33	12	400 00
Prescott	R. Parks	April 6, 1822	"	May 1, 1899	33 33	12	400 00
Rat Portage	Mrs. J. Lusk	May 10, 1850	"	Dec. 7, 1901	33 33	12	400 00
Stratford	J. P. Murray	July 29, 1835	Engineer	Jan. 26, 1900	50 00	12	600 00
St. Catharines	Leads Reno	Oct. 24, 1842	Cartaker	Feb. 27, 1897	33 33	12	400 00
St. Thomas	James Russell	Sept. 15, 1832	"	Sept. 4, 1885	33 33	12	400 00
Strathroy	Wm. J. Johnston	May 12, 1840	"	Oct. 25, 1890	33 33	12	400 00
Smith's Falls	R. W. Lewis	Aug. 19, 1863	"	Jan. 8, 1896	25 00	12	300 00
Toronto	W. J. Smith	Nov. 11, 1840	Foreman, engineer	Dec. 9, 1897	100 00	12	1,200 00
"	C. H. Riddle	Sept. 22, 1852	Fireman	Jan. 13, 1891	55 00	12	650 00
"	Fred. Kington	Oct. 16, 1865	"	Nov. 1, 1893	55 00	12	650 00
"	Ed. Switzer	" 10, 1856	Host-attendant	Aug. 18, 1901	55 00	12	650 00
"	James Cosgrove	Feb. 10, 1841	Engineer	Dec. 28, 1874	70 00	12	840 00
"	Ed. Appleton	Sept. 26, 1864	Fireman	Sept. 23, 1886	55 00	12	650 00
"	Alexander Day	" 27, 1863	Host-attendant	Dec. 1, 1887	50 00	12	600 00
"	Wm. Clenchy	Dec. 19, 1851	"	" 1, 1887	50 00	12	600 00
"	Wm. J. Sloan	July 5, 1855	"	" 3, 1888	50 00	12	600 00
"	James Richardson	Feb. 23, 1831	Watchman	Sept. 3, 1888	46 50	12	558 00
"	J. Cormack	Nov. 26, 1872	Host-attendant	Oct. 17, 1901	50 00	12	600 00
"	J. Somers	April 8, 1855	Engineer	" 9, 1897	15 00	8	360 00
"	George Lotzky	May 20, 1858	Fireman	Nov. 1, 1896	50 00	8	400 00
"	G. Phillips	Oct. 11, 1856	"	Oct. 1, 1898	15 00	8	360 00
"	Richard Kye	" 11, 1849	"	March 25, 1885	50 00	12	600 00
"	D. Gilman	Aug. 8, 1867	"	Oct. 1, 1898	50 00	8	400 00
"	M. W. Devane	" 28, 1867	Watchman	June 1, 1900	50 00	12	600 00
Trenton	David Allen	May 13, 1844	Cartaker	Aug. 31, 1899	33 33	12	400 00
Windsor	L. Balloperdie	Oct. 26, 1848	Engineer	Dec. 24, 1897	50 00	8	400 00
"	W. Crites	March 6, 1844	Cartaker	Nov. 9, 1880	33 33	12	400 00
Walkerton	F. Gibson	Aug. 14, 1838	"	" 1, 1897	33 33	12	400 00
Windsor	T. Giles	March 30, 1843	"	Aug. 1, 1897	50 00	12	600 00
"	E. McNeil	April 29, 1833	"	Oct. 13, 1898	33 33	12	400 00
"	J. D. McDougall	May 1, 1843	Engineer	Jan. 21, 1900	40 00	12	840 00
"	John Mikulecky	" 6, 1879	Fireman	Nov. 13, 1900	45 00	12	540 00
"	Joseph Goutu	" 10, 1843	Host-attendant	March 16, 1887	45 00	12	540 00
"	Joseph Gagner	April 11, 1853	Watchman	June 7, 1892	45 00	12	540 00
Winnipeg	J. R. Russell	Oct. 15, 1857	Fireman	Dec. 12, 1900	45 00	12	540 00
"	G. L. Fraser	20, 1851	Cartaker	Aug. 1, 1894	40 00	12	480 00
"	E. N. Brown	March 8, 1845	"	Jan. 24, 1891	45 00	12	540 00
"	R. Wythe	July 7, 1839	"	June 21, 1894	33 33	12	400 00
"	E. J. Holder	Aug. 1, 1854	"	March 1, 1901	35 00	12	420 00
"	J. C. Jopp	Jan. 6, 1845	"	April 29, 1897	50 00	12	600 00
"	R. Shale	July 21, 1865	"	Nov. 21, 1898	33 33	12	400 00
"	John Ryan	June 24, 1827	"	" 1, 1893	14 58	12	175 00
"	J. H. C. Bay	Jan. 24, 1841	"	June 1, 1900	14 00	12	540 00



Place	Building	Name	Date of Birth	Position	Date of Appointment	Monthly Salary.	Time employed each Year.	Yearly Salary.	
						£	cts.	£	cts.
Prince Albert	"	Land and registry office.	Jan. 13, 1833	Caretaker.	Aug. 25, 1893	33	33	12	400 00
Regina	"	Court house & C. house.	March 24, 1840	"	" 1, 1889	45	00	12	540 00
"	"	"	Dec. 9, 1840	Fireman.	Oct. 3, 1898	40	00	8	320 00
Windsor	"	Land office	July 22, 1863	Caretaker.	May 6, 1901	33	33	12	400 00
Athol	"	Court house	Dec. 2, 1857	"	March 1, 1901	45	00	12	540 00
B.C.	"	Public building	"	"	June 26, 1901	12	00	12	144 00
Nanaimo	"	Post office	Sept. 2, 1836	"	May 1, 1897	50	00	12	600 00
New Westminster.	"	"	Dec. 21, 1870	"	Jan. 18, 1901	50	00	12	600 00
Vancouver	"	Public building	April 6, 1843	"	Aug. 25, 1898	50	00	12	600 00
"	"	"	March 21, 1836	Watchman	Feb. 10, 1901	50	00	12	600 00
Victoria	"	New Dominion building	Dec. 31, 1857	Caretaker.	" 4, 1898	50	00	12	600 00
"	"	Dominion building	May 12, 1858	Asst. caretaker.	April 1, 1899	45	00	12	540 00
"	"	"	Oct. 12, 1840	Fireman.	Oct. 4, 1898	45	00	8	360 00
"	"	"	July 8, 1876	Elevatorman	Nov. 27, 1898	45	00	12	540 00
"	"	Dominion building	Aug. 9, 1845	Elevatorman	" 13, 1900	45	00	12	540 00
"	"	Old Custom House....	Feb. 12, 1843	Caretaker.....	May 8, 1900	50	00	12	600 00

JOS. VINCENT.



# OFFICIAL CORRESPONDENCE

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## DEPARTMENT OF PUBLIC WORKS

FROM

JULY 1, 1867, TO JUNE 30, 1901







## SESSIONAL PAPER No. 19

NUMBER of Cheques sent by Accountant to Secretary's Branch and mailed through the latter, from 1882 to 1901.

Year.		No.
1882	From September 22 to June 30, 1883	1,566
1883	" July 1 " 1884	3,366
1884	" " " 1885	3,298
1885	" " " 1886	3,466
1886	" " " 1887	4,198
1887	" " " 1888	4,692
1888	" " " 1889	4,960
1889	" " " 1890	4,819
1890	" " " 1891	5,376
1891	" " " 1892	5,400
1892	" " " 1893	7,174
1893	" " " 1894	7,792
1894	" " " 1895	8,745
1895	" " " 1896	9,849
1896	Records incomplete; partially destroyed by fire, February 11, 1897	
1897	From July 1 to June 30, 1898	10,858
1898	" " " 1899	16,495
1899	" " " 1900	12,991
1900	" " " 1901	21,269

CHEQUES issued by Finance Department and mailed from Secretary's Branch.

Year		No.
1885	From April 1 to June 30, 1885	245
1886	" July 1 " 1886	954
1887	" " " 1887	1,158
1888	" " " 1888	918
1889	" " " 1889	887
1890	" " " 1890	908
1891	" " " 1891	790
1892	" " " 1892	820
1893	" " " 1893	822
1894	" " " 1894	868
1895	" " " 1895	594
1896	" " " 1896	267
1897	Records incomplete; partially destroyed by fire, February 11, 1897	
1898	From July 1 to June 30, 1898	332
1899	" " " 1899	213
1900	" " " 1900	1,357
1901	" " " 1901	507



1-2 EDWARD VII., A. 1902

## LETTERS Received and Sent, Chief Architect's Office, from January 1, 1880, to June 30, 1901.

Year.		Received.	Sent.
1880	-From January 1 to June 30.		1,273
1880	" July 1		2,943
1881	" "		2,859
1882	" "	3,538	4,600
1883	" "	3,860	6,004
1884	" "	4,506	6,718
1885	" "	6,075	6,450
1886	" "	6,816	6,380
1887	" "	6,947	6,870
1888	" "	6,484	7,667
1889	" "	7,448	6,578
1890	" "		7,751
1891	" "	6,113	4,260
1892	" "	7,428	6,453
1893	" "	6,900	4,517
1894	" "	7,538	5,327
1895	" "	7,843	5,783
1896	" "	10,700	8,200
1897	" "	10,867	8,547
1898	" "	10,913	8,762
1899	" "	12,386	9,878
1900	" "	12,287	9,860
1901	" "		

\* The exact number of letters received cannot be accurately given, but would bear about the same proportion to the letters sent as last year.

† The decrease in the number of letters sent, is due to a change made on January 1, 1894, in the manner of transmitting accounts to the Secretary. Previous to that date a letter accompanied each account, but now a bundle of accounts goes with each letter.

## LETTERS Sent from Chief Engineer's Office, from Jan., 1880 to June, 30, 1901.

Year.	No.
1880	From January 10, to June 30
1880	July 1.
1881	1881.
1882	1882.
1883	1883.
1884	1884.
1885	1885.
1886	1886.
1887	1887.
1888	1888.
1889	1889.
1890	1890.
1891	1891.
1892	1892.
1893	1893.
1894	1894.
1895	1895.
1896	1896.
1897	1897.
1898	1898.
1899	1899.
1900	1900.
1901	1901.

NOTE.—The letters, including returns, received in the Chief Engineer's Office may be estimated at the rate of two received to one sent.





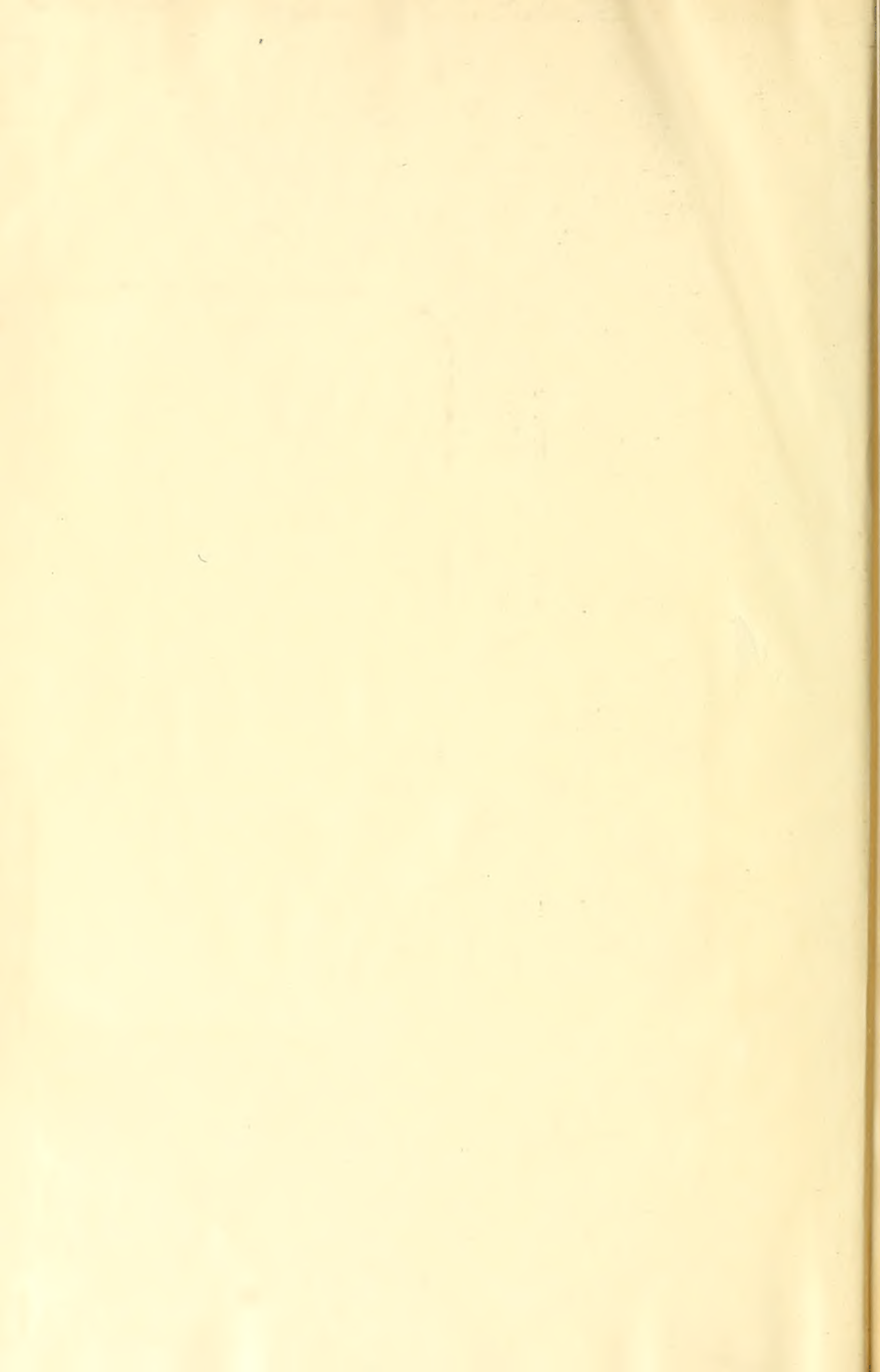














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